

The evolution of British tactical and operational tank doctrine and training in the First World War

PHILIP RICHARD VENTHAM TD BA (Hons.) MA.

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ABSTRACT

Tanks were first used in action in September 1916. There had been no previous combat experience on which to base tactical and operational doctrine for the employment of this novel weapon of war. Training of crews and commanders was hampered by lack of vehicles and weapons. Time was short in which to train novice crews. Training facilities were limited.

Despite mechanical limitations of the early machines and their vulnerability to adverse ground conditions, the tanks achieved moderate success in their initial actions. Advocates of the tanks, such as Fuller and Elles, worked hard to convince the sceptical of the value of the tank.

Two years later, tanks had gained the support of most senior commanders. Doctrine, based on practical combat experience, had evolved both within the Tank Corps and at GHQ and higher command. Despite dramatic improvements in the design, functionality and reliability of the later marks of heavy and medium tanks, they still remained slow and vulnerable to ground conditions and enemy counter-measures. Competing demands for materiel meant there were never enough tanks to replace casualties and meet the demands of formation commanders.

This thesis will argue that the somewhat patchy performance of the armoured vehicles in the final months of the war was less a product of poor doctrinal guidance and inadequate training than of an insufficiency of tanks and the difficulties of providing enough tanks in the right locations at the right time to meet the requirements of the manoeuvre battles of the 'Hundred Days'.

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ABBREVIATIONS

ASC	Army Service Corps
AG	Adjutant-General (Branch of the War Office)
BEF	British Expeditionary Force
BGGS	Brigadier-General, General Staff (of the BEF)
BM	Brigade Major
C-in-C	Commander in Chief (of the BEF)
CID	Committee of Imperial Defence
CIGS	Chief of the Imperial General Staff
CO	Commanding Officer (of a Battalion or Regiment)
COS	Chief-of-Staff (of GHQ)
DSD	Director, Staff Duties (at the War Office)
DTS	Director, Transport Supplies (at the War Office)
GHQ	General Headquarters (of the BEF)
GSO1	General Staff Officer Grade 1 (Lieutenant-Colonel)
GSO2	General Staff Officer Grade 2 (Major)
GSO3	General Staff Officer Grade 3 (Captain)
HB MGC	Heavy Branch, Machine Gun Corps
HS MGC	Heavy Section, Machine Gun Corps
HQ	Headquarters (of any formation)
KCL	King's College London
MG	Machine Gun
MGC	Machine Gun Corps
MGO	Master-General of the Ordnance
MMGC	Motor Machine Gun Corps
MOM	Minister/ Ministry of Munitions
MT	Motor/Mechanical Transport
OH	Official History of the Great War
OR	Other Rank (i.e. other than commissioned or warrant officer)
RND	Royal Naval Division
RNVR	Royal Navy Volunteer Reserve
RO	Reconnaissance Officer (in the Tank Corps)
TM	Tank Museum, Bovington
TNA	The National Archives, Kew
WD	War Diaries
WO	The War Office

Note:

Cited works were published in London except where shown otherwise

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There was no guidance as to training - the entire system had to be thought out from the beginning, and continually modified by the experience of the battlefield - instructors had not only to be found but trained - esprit de corps and discipline had to be built up; and all this against time.¹

INTRODUCTION

On 15 September 1916 after nearly two years of development and numerous setbacks, 21 British tanks rolled into action on the Somme for the first time.² Manned by hastily recruited and trained crews, 'the trickle of tanks only made a slight contribution to the day's success, such as it was'.³ The tactical employment of the tank evolved over the following years largely as the result of experience gained on the battlefield. The crews and commanders needed to be trained how to drive and maintain the new vehicles; and how to navigate them over the battlefield and fight them. Initially, their training was rudimentary, hampered by a lack of vehicles and

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Elles, Hugh, Major-General. Introduction to C & A Williams-Ellis, *The Tank Corps* (Country Life, 1919), p.vi.

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There are conflicting opinions on how many tanks actually went into action on 15 September. Harris, quoting Liddell Hart and Terraine, gives 50 tanks sent to France plus 10 reserves, 48 fit for action of which 36 reached the assembly point. 30 of these started and 21 fought in action. Harris, J P, *Men, ideas and tanks* (Manchester: Manchester University Press: Manchester, 1995) p.65,

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Liddell Hart, B.H., *The Tanks: The History of the Royal Tank Regiment and its Predecessors, etc 1914 -1945*. Volume I. 1914-1939 (Cassell, 1959), p.71.

inadequate training facilities.⁴ It concentrated on basic driving and gunnery skills, and was given by instructors only a little more knowledgeable than their students.

The novel weapon was untested in warfare and the early tactical and operational employment was based on the best guesses and assumptions of a number of 'experts'. Higher commanders needed to be educated in the most effective use of these weapons. This required a body of tactical and operational doctrine on which to base the training requirements, doctrine that was capable of being adapted in the light of battle experience.

This thesis explores the processes by which the training of tank crews and commanders evolved during the course of the Great War in response to combat experience, enemy counter-measures, technical improvements and the accumulation of experience by higher command. It explores the evolution of tactical and operational doctrine in the light of combat experience. It argues that the tanks' patchy performance in the Hundred Days was not so much the result of flawed tactical and operational doctrine or of inadequate training of crews and commanders but because of the inadequate numbers and the inevitable mechanical shortcomings of an innovative weapon of war.

SOURCES AND LITERATURE REVIEW

There is a substantial body of academic and other literature concerning tanks in 1914-18. Generally, these fall into three categories: discussions about the origins of the tank; works that document the technical development of the tank; and numerous accounts of the tanks in action, their successes and failures. There is little in the

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Glanville, John, *The Devil's Chariots* (Stroud: Sutton, 2006 [2001]), pp.215-238; Mitchell, Frank, *Tank Warfare* (Nelson, 1934), pp.68-87.

current historiography of tanks in the Great War that deals with the tactical and technical training of tank crews and commanders, nor, equally importantly, about the education of senior commanders concerning the operational employment of this novel weapon of war.

Until relatively recently, the historiography of the evolution and employment of the tank in the Great War was dominated by two commentators, Major-General J.F.C. Fuller and Captain Basil Liddell Hart. Fuller's opinions tended to encourage the popular view that the tank could have been a war-winning weapon had it been taken up more enthusiastically by higher commanders. Recently scholarship has taken a more nuanced view.

Nonetheless, Fuller was as a key figure. 'A controversial and prolific writer, Fuller laid the conceptual foundations for the theory of armoured warfare and was heavily involved in the polemic debates over the future place of the tank in the structure of the British Army.'⁵ He produced numerous papers, instructions and memoranda on the employment of tanks in his rôle as a GSO1 at the HQ of the HBMGC, (later the Tank Corps) in France from early 1917 until August 1918. 'The tank was a new weapon with no precedents on which to base a doctrine for tactical employment. Fuller's ingenuity and formidable energy were tested by the challenge posed by this novelty.'⁶

However, most of Fuller's publications were produced after 1918 and concerned his interest, even obsession, in arguing for the pre-eminent role of armoured forces in future warfare. The problem for the historian in assessing

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Holden Reid, Brian, 'J F C Fuller' in Charles Messenger (ed.), *Readers' Guide to Military History* (Abingdon: Routledge, 2013 [2011])

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Holden Reid, B, *J F C Fuller - Military Thinker* (Macmillan 1987), p.30

Fuller's contribution to the development of tactical doctrine and training during the First World War is two-fold. They must decide first, to what extent did Fuller's extensive and forthright opinions on the operational employment of tanks influence higher commanders? Second, how much has he influenced the post-war debate on the use of tanks during the First World War ⁷ Care must be taken to consider the papers and ideas that he actually produced during the war and treat with caution his later writings. Bryn Hammond makes this same point:

To reach a balanced assessment of the BEF's actual employment of tanks in battle in the First World War, analysis must be strictly confined to ideas and projects planned and executed during the war that were based on or used the various tank models that actually saw service on the Western Front in the period 1916-1918. The reader is enjoined to put aside any knowledge of post-war tank development and tactical theory and concentrate only on the actualities of the First World War.⁸

However, Fuller's 1920 book does have a useful chapter on the establishment of the initial training centres. He also briefly described the later organisation of the Tank Corps Central Schools.⁹

Basil Liddell Hart had no direct connection with the Tank Corps, but was commissioned to write the authorised history of the Royal Tank Regiment.¹⁰ Unlike some of his other writings this work is generally regarded as being an accurate work of scholarship, subject as it was to the 'peer scrutiny' of the participants of events and actions depicted, albeit it is not referenced.¹¹ Liddell Hart was a close friend of

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Holden Reid, *Fuller*, p.5.

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Hammond, B, 'The theory and practice of tank co-operation with other arms on the Western Front in the First World War.' (University of Birmingham, PhD, 2009), p.16.

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Fuller J.F.C. *Tanks in the Great War* (New York: Dutton, 1920).

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Liddell Hart, *The Tanks*

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Fuller and was undoubtedly influenced by Fuller's opinions and tended to endorse his views.¹²

Care therefore needs to be exercised in using Liddell Hart as a source. Gary Sheffield described him as 'a vain man, determined to portray himself as a prophet of modern warfare who struggled against the forces of military reaction.'¹³ Furthermore, Liddell Hart was not above using selective extracts from primary sources to validate his opinions.¹⁴ Although, inevitably, his regimental history deals largely with the operations and actions of the Tank Corps during the Great War, he does also include some details of the early training of tank crews in England before they were despatched to France.

The new weapon of war spawned a number of near contemporary memoirs, personal testimonies and accounts of the tank in action. Of these perhaps the most comprehensive is a history of the Tank Corps published privately in 1919 by Major Clough Williams-Ellis and his wife, Alice.¹⁵ Williams-Ellis served as the Reconnaissance Officer of 1 Tank Brigade between 1917 and 1918 and had first-hand experience of many of the events described. There is a useful chapter on training at Elveden and another on the training at Bermicourt in France in late 1916 and early 1917. He gives a short account of training at the Central Schools at Bovington from 1916. However, his viewpoint is that of a relatively junior regimental

¹² Harris, *Men, ideas and tanks* p.2

¹³ Mearsheimer, J, *Liddell Hart and the Weight of History* (Brassey's, 1988)

¹⁴ Sheffield, Gary, *The Chief: Douglas Haig and the British Army* (Aurum, 2012 [2011]), p.347

¹⁵ Sheffield, *The Chief*, p.347; Mearsheimer, *Liddell Hart*, p.13.

Williams-Ellis, *Tank Corps* (Country Life, 1919)

and staff officer and throws little light on the formulation of tactical and operational doctrine on which training had to be based.

Captain D.G.Browne, a tank commander, later a reconnaissance officer, in G Battalion arrived in France in May 1917. His book, written in 1920, largely recorded in great detail actions that he was personally involved in together with brief accounts of early training at Thetford and at Bermicourt. Though somewhat partisan, his writings drew out many of the lessons learnt, some from painful personal experience, from the tank actions of 1917 and 1918.¹⁶

Major William Watson, a Company Commander in D Battalion of HB MGC in 1917 and commander of 4 Tank Supply Company of the Tank Corps in 1918, published in 1920 an account of his experiences with tanks.¹⁷ As with the other near contemporary accounts, Watson recounted in vivid detail the actions he was personally involved in. He devoted a chapter to the problems of training the tank crews in France and gives some useful insight into the training of the Tank Supply Companies of which he was a commander.

Captain Richard Haigh published a contemporary memoir in June 1918 when many of the Tank Corps' actions during the 'Hundred Days' were yet to be fought. His is a short account written in the third person in a somewhat light-hearted style. While again giving a good account of tanks in action, it also throws some light on the training of tank crews in France.¹⁸

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¹⁷ Browne, Captain D.G., *The Tanks in Action* (Blackwood, 1920)

¹⁸ Watson, Major W.H.L., *A Company of Tanks* (Blackwood, 1920)

Haigh, Richard, *Life in a tank* (Boston: Houghton Mifflin, 1918)

Possibly the best, near contemporary, first-hand account of Tank Corps training in the UK is provided by Frank Mitchell. Although written in 1934, Mitchell described in detail the progress of a young Tank Corps officer cadet's training at Pirbright, Wareham and Wool before being commissioned and despatched to France as a tank commander.¹⁹

The archives of the Tank Museum at Bovington provide a rich source of largely untapped primary sources. There are a number of contemporary histories produced towards the end of the war of the various branches of the training organisations in Britain and France.²⁰ Supplementing these is the personal journal of Fuller whilst he was GSO1 at Tank Corps HQ containing not only his sometimes acerbic and candid opinions of senior commanders' views on tanks but, more usefully, copies of correspondence to and from Tank HQ and the higher formations and Tank Brigades. Together with Fuller's lengthy papers on tank operational doctrine, training directives and after-action reports, they help the historian to piece together the evolution of tank tactical and operational doctrine.

The Liddell Hart Centre for Military Archives at King's College, London contains additional Fuller material. Although often duplicating the Tank Museum material, the Fuller volumes there also close many of the gaps in the official correspondence. Similarly, The Liddell Hart Centre also holds the papers of Liddell Hart and of Colonel Ernest Swinton, one of the early proponents of the tanks.

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Mitchell, F, *Tank Warfare* (Nelson, 1934)

²⁰

See, for example, *Tank Corps History: Central Schools, Bovington; Tank Gunnery School, France; Tank Gunnery School, England 1916-19, etc.* The archives of the Tank Museum, Bovington (Hereafter TM) 355.486.86

The National Archives hold much of the surviving official correspondence to and from GHQ and the HQ of the Tank Corps in France and between GHQ and the Tank Directorate in London. The National Archives also hold the War Diaries for most Tank Corps Battalions and Brigades, supplementing those held in the Tank Museum archives.

Many of the more recent Great War historians deal with the influence of tanks on tactics and operations in the latter stages of the war. Few however go into great detail about how those tactics and operations evolved and were reflected in the training of the Tank Corps. Of the modern academic works concerning tanks in the Great War, Harris's book, published in 1995, is probably the best at tracing the early development of tank tactics at the time when the HB MGC had very little practical battle experience to work on. He continues with the debates between the advocates of 'mechanical warfare' and 'traditional' methods in the latter stages of the war which will be dealt with later in the thesis.²¹

David Childs' book deals with the 'Search for a Tactical Doctrine of Employment' in Part III of his work. The organisation of the Tank Corps in France which has some bearing on the training organisation is also described. There is also a useful section on the subject of combined infantry and tank training, one aspect of the overall learning process which will be explored further in this thesis.²²

John Glanville's book deals largely with the difficulties encountered in the initial design and development of a practical armoured fighting vehicle, the subsequent modifications and evolution of the tank, of the rivalries and lack of co-

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Harris, *Men, Ideas and Tanks*

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Childs, David, *A Peripheral Weapon? The Production and Employment of British Tanks in the Great War*. (Westport CT & London: Greenwood Press, 1999)

operation between the service and government departments involved and the practical difficulties in the supply of sufficient tanks to the users in the front line.²³

Paddy Griffith argues that the effectiveness of the tank 'was considerably less potent in practice than its propagandists would have us believe.' Pointing out the need for training in tank and infantry co-operation both before and after the Battle of Cambrai, his chapter on 'Doctrine and Training' chronicles the general development of training doctrine in the BEF through, in part, the system of 'SS' publications. He touches briefly on the pamphlets specifically concerned with tank training, tank co-operation with infantry and anti-tank defence. The evolution of tank training doctrine will be examined further in this thesis.²⁴

Harris, in Bond and Cave's compilation of essays published in 1999, includes a chapter on 'Haig and the Tank'. He sets out to challenge the view held by a number of historians that Haig was not receptive to new technology and did not fully embrace the potential of the tank in breaking the stalemate on the Western Front.²⁵ He argues that, on the contrary, it was Haig's over-enthusiastic support of tanks that led to them being used too soon and in insufficient numbers on the Somme in September 1916. The short essay describes some of the earlier concepts for the use of the new weapon but does not go into any detail of the subsequent evolution of mobile warfare doctrine at higher command.²⁶ A recently published collection of essays includes chapters on practical considerations of tank operations by Bryn

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Glanfield, John, *The Devil's Chariots: The Birth and Secret Battles of the First Tanks* (Stroud: Sutton Publishing, 2001)

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Griffith, Paddy, *Battle Tactics of the Western Front: The British Army's Art of Attack 1916-1918* (Yale University Press, 1994)

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See Tim Travers, *How the war was won* (Routledge, 1992) and Denis Winter, *Haig's Command: A Re-assessment* (Viking, 1991)

²⁶

Hammond; Tank Corps reconnaissance and intelligence by Jim Beach; on tank communications by Brian N. Hall and on the aftermath of Cambrai by Alaric Searle.²⁷

The range of literature dealing with specific tank actions is substantial. Several stand out from amongst the pile. The late Trevor Pidgeon's two books on the various tank actions on the Somme are outstanding in the depth of research he devoted to tracing the actions of tank units and, in many cases, of individual tanks.²⁸ Similarly, Bryn Hammond's book on Cambrai provides a comprehensive and critical account of the tank actions during that operation.²⁹ For the tank operations at Amiens in August 1918, Charles Messenger's book is significant.³⁰ More recently, Ian Verrinder has produced an account of B Battalion's experiences at Messines, Third Ypres and Cambrai using previously unknown personal crew testimonies which provide some insights into tank training in France in early 1917.³¹ Another recently published book by Stephen Pope traces the individual histories of some of the tankmen who took part in the initial tank action on 15 September 1916.³² Most of

Bond, B. & Cave, N. (eds.), *Haig: A re-appraisal 80 years on* (Barnsley: Pen & Sword, 2009 [1999])

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Searle, Alaric, (ed.) *Genesis, Employment, Aftermath; First World War Tanks and the New Warfare, 1900-1945* (Solihull: Helion, 2015)

²⁸

Pidgeon, Trevor, *Tanks at Flers* (Cobham: Fairmile Books, 1995); and *Tanks on the Somme; From Morval to Beaumont Hamel* (Barnsley: Pen & Sword, 2010)

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Hammond Bryn, *Cambrai 1917: The Myth of the First Great Tank Battle* (Weidenfeld & Nicholson, 2008)

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Messenger, Charles, *The Day we Won the War. Turning point at Amiens 8 August 1918* (Orion, 2009 [2008])

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Verrinder, Ian, *Tank Action in the Great War: B Battalion's Experiences 1917* (Barnsley: Pen and Sword, 2009)

³²

Pope, Stephen, *The First Tank Crews* (Solihull: Helion, 2016)

these accounts of specific actions, however, deal with the tactics and the outcomes of the actions depicted; few concentrate on the training and preparation of tank crews and commanders before action or how training doctrine evolved as a result of lessons learnt. This thesis will seek to correct this omission.

Surprisingly, there are few scholarly journal articles on the specific subject of tanks. Travers argued in his 1992 paper that tanks could have been war winners earlier in 1918 had there been sufficient numbers and had they been used appropriately by a GHQ that was more receptive to the idea of using tanks. In short, the problem was more 'mental than mechanical'.³³ This argument was further addressed in Child's 1994 paper where he argues that, far from Travers' suggestion that 'armies got no guidance from above except by suggestion', GHQ in fact issued a whole series of manuals and instructions regarding the tactical and operational employment of tanks.³⁴ This argument will be developed further in this thesis. The paper which comes closest to dealing with the training of the Tank Corps is Bryn Hammond's PhD thesis which examines the question of tank co-operation with other arms. It necessarily concentrates on this aspect rather than with other aspects of tank training.³⁵

This thesis will take a broader view of the training of the Tank Corps; the initial training of the tank crews and commanders, the subsequent evolution of the various tank training schools in England and France, and the development of tank training doctrine in the light of combat experience.

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Travers, Tim, 'Could the tanks of 1918 been war winners for the British Expeditionary Force?', *Journal of Contemporary History*, 27 (2) (July 1992), pp.389-406

³⁴

Childs, David, 'Were the tank problems of 1918 as much mental as mechanical?' *Bulletin of Military History Research*, 44 (1994), pp. 143-155

³⁵

Hammond, 'Theory and practice'.

In summary, although there is a considerable volume of literature on tanks most seem to concentrate on the genesis and development of the tank or on the conduct and outcomes of actions in which tanks were involved. There is little in the current historiography that deals with the inseparable aspects of the evolution of tactical and operational tank doctrine and the formulation and practice of training tank crews and commanders and the education of senior commanders. This thesis will bridge this small gap in the current historiography of the Tank Corps in the Great War.

RESEARCH QUESTIONS

In seeking to fill this gap in the historiography, the following research questions need to be addressed. How did tactical requirements first evolve in the absence of combat experience? How did early training address the perceived tactical requirements? How did those requirements evolve in the light of actual battle experience? How was training implemented? What was the training organisation? What were the restraints on training, was it effective? How did tank operational doctrine evolve? Who derived it and how? How was it implemented? How did it fit in with overall BEF operational doctrine? Finally, to what extent did tank operational and tactical doctrine and training contribute to the outcome of the Hundred Days?

Research has been largely conducted in the extensive archives of the Library of the Tank Museum at Bovington, with supplementary work in the records held in the Liddell Hart Centre for Military Research at King's College London and The National Archives. Dealing, as it does, with an evolutionary process, the thesis necessarily follows a largely chronological theme, highlighting specific aspects of the

process. It concentrates on operations on the Western Front from the introduction of the tank in September 1916 until the Armistice in November 1918. It will not consider nor be influenced by the post-war debate on the future role of armoured forces in the British Army, or the employment of British armoured vehicles in other theatres of war.

NOMENCLATURE AND DEFINITIONS

The organisation responsible for armoured warfare underwent a number of changes of title during the Great War. It began as the Heavy Section (later, Heavy Branch) of the Machine-Gun Corps, before being renamed the Tank Corps. Many contemporary histories and references use these titles without strict regard to chronology. In general, this thesis will follow chronological usage but may occasionally use the generic title of 'The Tank Corps'.

In this thesis reference will frequently be made to operational and tactical doctrine. In identifying the difference between these two levels of military activity, useful definitions are provided by Gary Sheffield: 'The tactical level refers to the conduct of battles. The operational level refers to the conduct of campaigns, and serves as a link between strategy and tactics, the highest and lowest levels of war.'³⁶ Mearsheimer similarly defines tactics as: 'tactics is a more narrowly focussed concept [than strategy]: the focus is on the specific battlefield employment of the different elements that comprise an army or its supporting air forces. Tactics deals with questions about how specific military units are used to win particular battles.'³⁷

Doctrine is a concept that is more difficult to define and has received much attention among military historians. In 1922 Fuller defined doctrine as:

The central idea of an army.....To be sound [it] must be based on the principles of war, and which to be effective must be elastic enough to admit of mutation in accordance with change in circumstance.....this central idea or doctrine is nothing else than common sense- that is, action adapted to circumstances.³⁸

³⁶

Sheffield, Gary, *Forgotten Victory; The First World War: Myths and Realities* (Headline Publishing Group, 2001), p.xxii

³⁷

Mearsheimer, *Liddell Hart*, p.16

³⁸

Sheffield argues that although the British Army 'went through the First World War without a formal doctrine in the modern sense' it did 'however, have body of doctrine in the form of the *Field Service Regulations*' and that 'rather than being prescriptive, FSR set out broad principles for action.'³⁹ Other historians have attempted to define doctrine, among them Bidwell and Graham, Christopher Pugsley, Hew Strachan and Albert Palazzo.⁴⁰

In this thesis, the rather more 'traditional' definition of doctrine, as representing a body of 'common standards and routines' or 'standard operating procedures' will be adopted. It will be shown that, as the Tank Corps expanded in size and learned lessons from combat experience, tactical and operational doctrine emerged. The newly formed Tank Corps embracing recruits from civilian life as well as from all levels of the army social hierarchy from smart cavalry regiments to the ASC, had to create its own *esprit de corps* through its training processes. It had no traditions or history to look back on and the creation of *esprit de corps* featured heavily in the outcomes of the various training programmes which will be discussed further.

Fuller, J.F.C., quoted in Sheffield, 'Doctrine and Command in the British Army: E-1 An Historical Overview', in *Army Doctrinal Publication - Operations Annex* (Shrivenham, 2010), p.E-2

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Sheffield, 'Doctrine and Command', p.E-9

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See Bidwell, Shelford and Graham, Dominic. *Firepower; The British Army Weapons & Theories of War 1904-1945* (Barnsley: Pen & Sword, 2004 [1982]); Pugsley, Christopher, 'We Have Been Here Before: The Evolution of the Doctrine of Decentralised Command in the British Army 1905-1989' *Sandhurst Occasional Papers* No.9 (2011); Strachan, Hew, 'Operational Art and Britain, 1909-2009' p.97 quoted in Pugsley 'Been here before' p.6 and Palazzo, Albert, *Seeking Victory on the Western Front: The British Army and Chemical Warfare in World War I* (Lincoln and University of Nebraska Press, 2000)

CHAPTER ONE - EARLY TACTICAL DOCTRINE AND TRAINING

THE EVOLUTION OF EARLY TACTICAL DOCTRINE

The design of the first operational tanks clearly had to be based on the early perceptions of the role of such an armoured vehicle. Paradoxically, the role of this novel weapon of war could not be fully assessed until it had gone into action for the first time. Equally, the training of crews and commanders depended on the production of a sound tactical doctrine on which to base training. The dilemma was neatly summarised by Major-General Hugh Elles, commander of the Tank Corps in France: 'There was no guidance as to training - the entire system had to be thought out from the beginning, and continually modified by the experience of the battlefield.'⁴¹ As a modern historian argues: 'the best method of using tanks could only be worked out by practical experiment.'⁴²

It was perhaps Lieutenant-Colonel Ernest Swinton who first articulated the tactical requirement for an armoured fighting vehicle on the Western Front. As the Assistant Secretary to the CID, he was sent to the Western Front in October 1914 as the official war correspondent, 'Eyewitness', to report back on the current situation there. He witnessed and was deeply concerned about the effects of German MGs and the difficulty of breaking through barbed wire entanglements. He described to Maurice Hankey, the Secretary of the CID, the impasse which was developing.⁴³ Faced with indifference at higher command levels, on 28 December

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Elles, Major-General Hugh, Introduction to C & A Williams-Ellis, *The Tank Corps* (Country Life, 1919), p.vi

⁴²

Harris, *Men, ideas and tanks*. p.64.

⁴³

1914, Hankey produced his 'Boxing Day Memorandum'.⁴⁴ This included various proposals for overcoming the stalemate on the Western Front, among them Swinton's idea of an armoured 'caterpillar' vehicle capable of crossing and destroying enemy trenches. An informal committee was authorised to look into the question.

Hankey's proposals were taken up enthusiastically by Winston Churchill, the First Lord of the Admiralty, who, unbeknown to the War Office, was already sponsoring independent trials of various armoured vehicles for use by the Royal Naval Air Service [RNAS] and the Royal Naval Division [RND] in Flanders.

What was lacking was a considered appreciation of the tactical requirement for the proposed vehicle; in effect, a tactical doctrine. Swinton, clearly frustrated by his unsuccessful attempts since October 1914, both by 'verbal and personal representations' to get his concerns taken up by GHQ, sent a memorandum entitled 'The Necessity for Machine Gun Destroyers,' to the Sub-Chief of the General Staff, Major-General Henry Wilson, on 1 June 1915. Swinton saw the principal need as being for what he termed 'Machine Gun Destroyers'.⁴⁵

He identified German MGs as the 'chief factor which has rendered abortive our attempts to penetrate their positions', for which he proposed two solutions; the use of 'Artillery and high explosive ammunition to blast a way through the German positions', or 'some other means of destroying these weapons'. As sufficient artillery

Swinton, Major-General, Sir Ernest, *Eyewitness* (Hodder and Stoughton, 1932), pp.81-83

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The National Archives (hereafter TNA) MUN5/210/1940/13: Records of the Ministry of Munitions: Misc Papers: Hankey, Maurice, *Memorandum*, dated 28 December 1914.

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TM: E.2006.1095.3: 'The Necessity for Machine Gun Destroyers', 1 June 1915. Swinton's pencilled note on his copy of the memorandum reads 'NB. This was written on June 1st 1915 after efforts from October 1914 to get the matter taken up by verbal or personal representations.'

and HE was not yet available, 'Armoured Machine Gun Destroyers' might be 'the other means'. His description of such a vehicle was remarkably close to what was actually produced more than six months later. He emphasised the need to build the machines in secrecy and not to disclose their existence until enough were available.

In attack he suggested that 50 destroyers might be available, deployed in line at 100 yard intervals covering a frontage of around 5,000 yards or three miles. A preceding artillery bombardment would cut the wire entanglements and, at dawn, the destroyers would climb out of their pits and advance on the German lines at the rate of three miles an hour. They would crush any identified MGs and enfilade trenches using their 2 pounder guns and MGs. Artillery would thus be freed to concentrate on counter-battery tasks. The infantry would advance 'practically unscathed' by MGs. Once through the first line of trenches, the destroyers would turn and attack them from the rear, then proceed forwards supporting the first wave of attackers and 'the mass of troops forming the main body of the attack.' In defence, Swinton saw the tanks being used as 'mobile strong points' to be driven forward against any enemy penetration, a use to which many tanks were indeed put during the German March offensive in 1918.

Swinton's memorandum was the first attempt at formulating a tactical doctrine for the use of armoured vehicles on the Western Front. In hindsight, it is easy to identify obvious flaws. For example, the use of artillery as envisaged by Swinton, would have a number of consequences; first, the ammunition and fuses available at the time were not effective in cutting barbed wire or of destroying deep dug-outs; second, a preliminary bombardment would give away the vital element of surprise and allow the defenders to man their trenches once the bombardment had lifted and third, intense preliminary bombardments would crater the ground and render it difficult, if not impossible, for machines to cross. However, Swinton must be

credited with giving some constructive thought to overcoming the impasse on the Western Front and producing an early attempt at tactical doctrine for the armoured vehicles.

Field Marshal Sir John French, the C-in-C of the BEF, thought 'there appears to be considerable tactical value in the proposal' and forwarded the memorandum to the War Office suggesting that Swinton's proposal be placed in secret before an experienced firm for further investigation.⁴⁶ He stated that he understood that the Admiralty was already conducting experiments indicating that the Admiralty and the WO were not, at this stage, co-operating in a development that more directly affected the Army than the Navy.

Swinton returned to the UK in July 1915 as the Acting Secretary of the CID and was in a position to push forward the development of a suitable machine. He was concerned to co-ordinate the separate efforts of the Admiralty and the Army: 'I am doing my best to help to get the different designs of machines under consideration co-ordinated.'⁴⁷ Swinton called an Inter-departmental Conference on 28 August 1915 with representatives from the War Office, the Admiralty, and the Ministry of Munitions. The conference was held specifically to 'Consider future procedure as to the design and construction of "land cruisers" or armoured motor cars propelled by the "caterpillar" principle, for the use of the Army.' It was agreed that the Churchill's Land Ship Committee would continue to supervise the experimental work in design and construction of the land cruiser but taking

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TM: E2014.695: French to War Office, 22 June 1915.

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TNA: WO158/818: War Office Correspondence: GHQ: Tank Corps: Director General Tank Corps: Swinton to BEF Experimental Committee at GHQ, 23 August 1915.

instructions about the design requirements from the War Office. The whole was to be co-ordinated by the Inventions Department of the Ministry of Munitions.⁴⁸

As the possibility of a suitable machine was fast becoming a reality, thoughts were turning to the manning and training of the future crews. French had already indicated in his letter of 22 June 1915 that he wanted the training to be carried out in the UK. The conference reported that:

For the manning of these machines, also, special technical men will be required. The crews must include drivers experienced in handling caterpillar vehicles who will have to be trained almost as trick drivers in order to get the best out of the cruisers; mechanics in order to maintain and repair the machines; and skilled machine gunners able to shoot from moving platforms. These duties will have to be, to a large extent, interchangeable; and to enable them to be carried out will necessitate the collection of a body of men of a far higher class than that usually found in the ranks or amongst military motor transport drivers.⁴⁹

The next significant move in the development of a tactical doctrine came from Winston Churchill. Despite being demoted from First Lord of the Admiralty in May 1915 he managed to remain closely involved in the development of a 'land cruiser' by the Admiralty. Whilst serving as a battalion commander in France from January to May 1916 and witnessing at first-hand the stalemate, he considered the problem of breaking the trench deadlock on the Western Front. In early December 1915 he forwarded a paper entitled 'Variants of the Offensive' to Sir John French and others.⁵⁰

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TNA: WO158/818: Director General Tank Corps: Minutes of a Conference, 28 September 1915

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TNA: ADM116/1339: Admiralty Record Office: Landships Inception & Evolution: 'Report and Recommendations of an Interdepartmental Conference held on the 28 August 1915.'

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TNA: WO158/ 831: War Office Correspondence: Tanks: Churchill, W.S., *Variants of the Offensive*, 3 December 1915. Also reproduced, in part, as App. 17 to Miles, *Official History, France, 1916*, Vol. 2, Maps and Appendices

Under the heading 'Attack by Armour', Churchill envisaged the use of small armoured shields to protect advancing infantry. These could be propelled by hand 'during the short walk across from trench to trench.' In addition, he had a vision of larger 'caterpillar engines' which would pass 'through or across our trenches at prepared points.' Armed with two or three maxims and 'flame apparatus' they would turn parallel to the enemy trenches sweeping them with fire. The engine would be capable of crossing any known obstacles and be invulnerable to anything other than a direct hit from a field gun. In his enthusiasm, Churchill stated that 70 such machines were nearing completion and should be inspected. What he clearly did not know was that a tentative order for 70 machines had been abandoned and that experimental work was concentrated on a single machine that showed some promise. Although much of his paper was somewhat fanciful and did not reflect the practicalities of what machines were then currently available, his tactical proposals were remarkably similar to those propounded by Swinton earlier. There is no evidence that the two men had colluded in their proposals.⁵¹

Churchill's paper stirred some action within the Government departments involved. In late December, the existing Land Ship Committee was replaced by an inter-departmental Tank Supply Committee under the presidency of Lieutenant Stern, RNVR, who had been responsible for much of the Admiralty's earlier experimentation. The Admiralty did not want responsibility for further experimentation and the production and supply of future armoured vehicles that were clearly for the benefit of the Army. The WO wanted the establishment of a specialist corps of skilled drivers and mechanics to man the estimated 50 machines

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See Gary Sheffield, *Forgotten Victory*, pp.176 – 178 for a general discussion on Churchill's subsequent (post war) views on the use of tanks on the Somme which Sheffield describes as 'pure fantasy'.

required. Existing personnel from 20 Squadron RNAS were to form the nucleus of the new corps.⁵²

A further meeting of the Tank Supply Committee sat on Christmas Eve, 24 December 1915, and recommended an 'approximate establishment', based on the suggested number of 50 tanks, of one officer and 10 rank and file for every tank plus a 50% reserve. They therefore needed to recruit 75 officers and 750 other ranks. It was 'thought both officers and men should have some mechanical knowledge and aptitude, and that they should be drawn from those now serving in any branch of the forces or from civil life.' It considered 'that each member of this body of men should be trained to perform every duty which he might be likely to be called upon to carry out.' Personnel from 20 Squadron RNAS were to be given the opportunity of transferring into the new corps which would form a 'Tank Detachment' of the existing MGC.⁵³

In early January, the first experimental tank, nicknamed 'Mother', was demonstrated in Lincoln in front of a number of members of the Tank Supply Committee. Sir Douglas Haig, the new C-in-C of the BEF, had read Churchill's paper and, after enquiring; 'is anything known about the Caterpillar referred to in para. 4, page 3?' sent one of his Operations Staff Officers, Major Hugh Elles, (later to command the Tank Corps in France), to witness the new weapon and report back to him. Demonstrations of the new tank were held in late January at a secret location in Hatfield Park over an obstacle course of representative British and German trenches

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TNA: WO158/831: War Office Correspondence: GHQ: Tanks & Tactical Employment: 'The Present and Future Situation regarding the Provision of Caterpillar Machine Gun Destroyers or "Land Cruisers."', CID meeting 17 December 1915. Paper 227-B

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TNA: ADM 116/1339: Admiralty Record Office: Landships Inception & Evolution: Report dated 24 December 1915.

and wire entanglements. The Secretary of State for War, Lord Kitchener, attended and was apparently unimpressed. The King attended a trial a few days later.⁵⁴

Having received reports from his staff, Haig reported to the WO:

The reports of the officers who represented me at the trials...lead me to the conclusion that these 'Tanks' can be usefully employed in offensive operations by the forces under my command.⁵⁵

He ordered that between 30 and 40 tanks be ready by mid-May and asked whether further tanks might be ready by mid-July. He recommended that personnel should be 'supplied and trained at home.' He emphasised that 'Secrecy is of the highest importance in order to get full advantage from the use of these machines.' This endorsement by Haig of the new weapon indicates that GHQ was supportive of new initiatives. Following the trials, 100 machines were ordered by the WO, later increased to 150.⁵⁶

Until now, any consideration of the training of tank crews and commanders had been directed towards the mechanical aspects of their role; gunnery, driving and maintenance. There had been no mention of tactical training and little in the way of doctrine on which to base it. However, once the acceptance of the tank was assured, Swinton expanded his former thoughts into a more substantial document, 'Notes on the Employment of "Tanks"', published in late February.⁵⁷ This important

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⁵⁵ Liddell Hart, *Tanks*, (1) pp.48-50

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⁵⁶ TNA: WO 32/5754: Army Organisation: Formation of a Detachment of the MMGC: Haig to WO, 8 February 1916

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⁵⁷ TNA: WO32/5754: Army Organisation: Formation of a Detachment of the MMGC: Kiggell (CGS BEF) to WO, 5 April 1916

Swinton, Lieutenant-Colonel, 'Notes on the employment of 'Tanks'', February 1916. Liddell Hart Centre, King's College, London [hereafter, KCL] Fuller Papers I /1/3. Also reproduced as Appx.18 to Miles, *Official History, Military Operations, France and Belgium 1916* ,Vol.1 [hereafter Miles, *OH,1916* (1)]

seminal document formed the basis for tank tactical doctrine for the remainder of the war, although it was much altered in detail in the light of combat experience. A note inserted at the beginning of Swinton's document reads:

These notes as to measures of preparation and suitable tactics for tanks are not intended to imply that the whole of our offensive operations are to be subordinated to their action. They are put forward as a basis for early discussion of the possibilities and requirements of an entirely new weapon, so that by the time that it is ready for employment everything possible may have been done to ensure its success.

The first sentence is significant in that it foreshadows the debate that ensued during the following years over the operational role of the tank.⁵⁸

Swinton described the characteristics and armament of the current tank. The trench crossing ability had been increased to 10 feet as a result of the analysis of captured German trenches. The current armament was Hotchkiss machine guns with two naval Hotchkiss 6 pounder QF guns with an effective range of 2000 yards, mounted either side of the machine in detachable sponsons. Enemy machine guns would be destroyed either by crushing by the tank itself or by being engaged by the QF guns. The tank was rendered practically invulnerable to rifle and machine gun fire and shell splinters by 12mm hardened steel plate. Swinton proposed various methods of communicating with the accompanying infantry; small 'wireless telegraphy' sets, a trailing telephone cable, miniature kite balloons and smoke rockets. In practice, effective communication with the infantry remained a problem throughout the rest of the war.⁵⁹

There were limitations to the machines as yet unresolved. The crossing of rivers and canals would be difficult; existing bridges in the battle zone would not

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Swinton, 'Notes', Introduction

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Swinton, 'Notes', para.7

carry the weight of the tanks; woods and soft, muddy ground would impede progress. He recognised that the chief weakness of the tanks was their vulnerability to direct fire from artillery or even to high velocity, small calibre rifle fire which the Germans were thought to be developing. They would also be vulnerable to land mines. However, preparatory artillery counter-bombardment counter-measures could be devised to deal with these problems.⁶⁰

Swinton re-emphasised the important point that successful use of the tank depended on 'its novelty and in the element of surprise.' They should therefore '*not be used in dribblets*' [emphasis in original] and 'the fact of their existence should be kept as secret as possible until the whole are ready to be launched.'⁶¹

Swinton discussed various tactical matters. The operational sector needed to be carefully chosen in view of their limitations and in good time to allow for their deployment. Deployment routes needed to be carefully reconnoitred, bridges strengthened and river crossings prepared. In deployment the tanks should not be further than 150 yards apart and, with the 100 tanks ordered, allowing for reserves and flanking operations, a total frontage of some 9000 yards or three miles was envisaged. In a footnote, Swinton noted:

This calculation as to the extent of frontage will hold good whether the tanks are forward in one continuous line or in groups with intervals between the groups so that certain areas may be 'bitten off' by a lateral movement as soon as sufficient forward progress has been made. The selection of either method is a matter of general tactics, and not one specially connected with the employment of tanks.

This comment indicated an early, less prescriptive tactical doctrine resulting from, no doubt, general uncertainty about how the tanks would actually perform in battle. The

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Swinton, 'Notes', paras.9 & 10

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Swinton, 'Notes', para.11

tanks would assemble in line about two miles in rear of their starting points to which the routes would be reconnoitred and lit by lanterns for a night approach. Alternatively, tanks would move by night into previously dug pits close to the front-line from which they would emerge when the attack began.

The timing of the advance of the tanks in conjunction with the infantry was to be the subject of much debate over the following years. Swinton believed that the ideal time was at first light when there was sufficient daylight for the tank commanders to make progress. The tanks would advance first, sweeping the enemy trenches with machine gun fire. When they had advanced about three-quarters of the way through No-Man's-Land attracting enemy fire onto themselves, the infantry would sweep forward as the tanks enfiladed the trenches from the parapets. He rejected the alternative view that the infantry should advance first and the tanks would then only advance if and when the infantry got held up by uncut wire or MGs. He reasoned that the tanks would be needed from the outset to maintain the momentum of the attack.⁶² When the infantry had closed up, the tanks would then proceed at 'full speed' (i.e. four miles per hour) for the enemy second-line trenches, following and crushing the line of communications trenches to prevent the arrival of reserves and reinforcements.

Swinton discussed 'the Extent to which the Attack is pressed'. He debated the merits of the step-by-step operation with a strictly limited advance after artillery preparations, followed by a pause for consolidation and further artillery preparation before another advance. The alternative operation was of an all-out violent effort to burst through the enemy defensive lines. He stated that whichever course is taken depended on the wishes of the C-in-C and the strategic situation. However, with the

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Swinton, 'Notes', para. 21

advent of the tank, the ability to break through the defensive zone was now a feasible proposition. Swinton could foresee an advance of 12 miles in a day into the heart of the enemy artillery positions providing plans were made for the replenishment of the tanks and their crews.⁶³

On the question of co-operation with other arms, Swinton emphasised that 'tanks cannot win battles by themselves. They were purely auxiliary to the infantry.' They needed to be protected by reducing the effect of enemy artillery to which they are most vulnerable. This could only be done by the British artillery or by aerial bombardment concentrating not on the first-line defences, which the tanks could deal with themselves, but on the second-line artillery positions. Swinton concluded by saying that experiments were being conducted on methods of clearing wire entanglements.⁶⁴

Swinton's important paper represented more his vision of the employment of tanks than a prescriptive laying down of tactical doctrine. He posed a number of questions which needed to be considered and perhaps could not be resolved until the tanks had actually deployed in action.

On 26 June 1916, a conference at GHQ attended by Swinton agreed on the tactics that would form the basis of training:

... the tanks should move forward so as to reach the German first-line trench before dawn followed up by our infantry which is to start forward from our line as soon as the tanks reach the first line of the enemy; that in the further operations that will ensue by day-light, tanks should precede the infantry from place to place as quickly as possible; that the ultimate objectives of the tanks during this period of attack should be:-

1. The German artillery positions
2. The German 2nd or 3rd lines;

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Swinton, 'Notes', paras. 22 - 30

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Swinton, 'Notes', para. 45

That the German artillery positions might be assumed at an approximation to be at a distance of 2000 to 3000 yards from the German front line; that the training of the Tanks should proceed on these lines and that the maximum interval at which they should be spaced for the attack should be 150 yards; that the crews should be trained to drive in the dark; that the movement from the position of assembly to the starting point tapes may be laid forward up to a distance of about 1,000 yards from our firing line or the tanks may be led forward by guides up to that distance; further progress will be guided by disks painted with luminous paint.⁶⁵

At last Swinton had some firm guidance on which to base the training of his tank companies. In a letter of 8 July enclosing a copy of a provisional memorandum on tactical training addressed to the BGGS, he shows that he was anxious to proceed and could not wait to receive further views based on the experiences of the fighting on 1 July 1916.⁶⁶ He was no doubt aware that the likelihood of a major offensive, using tanks for the first time, was not far away.

The next significant progress in the production of tactical doctrine came with his memorandum produced in July 1916, entitled 'The Handling of the Heavy Section, Machine Gun Corps'. It was, according to a pencilled note on the copy in the KCL archives, written jointly by Swinton and his staff officers at HQ HSMGC. The memorandum emphasised, in capital letters:

THE PRIMARY OBJECT OF THIS UNIT [HS MGC] IS TO ASSIST THE INFANTRY BY DISPOSING OF THE PRINCIPAL DIFFICULTIES IN THE WAY OF THEIR ADVANCE IE, BARBED WIRE AND MACHINE GUNS.

BATTLES CANNOT BE WON BY TANKS ALONE AND IT IS BY INFANTRY AND INFANTRY ALONE THAT A DECISION CAN BE REACHED.

The section on training emphasised the following: 'all officers should be able to read a map- particularly a trench map - and understand the compass fitted in the Tank';

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TNA: WO32/5754/14: Army Organisation: Formation of a Detachment of the MMGC: *Digest of Decisions reached at Conference on the 26 June 1916.*

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TNA: WO32/5754/54: Army Organisation: Formation of a Detachment of the MMGC: Swinton to Major-General Burnett-Stuart (BGGS, GHQ), 8 July 1916

‘they should be practiced.... in synchronising their watches’; ‘they should be trained in the issue of precise and concise verbal orders to subordinates’; and ‘they must also be taught to exercise their imagination and to inspire that of their subordinates’. Section Commanders were to be encouraged to find rapid solutions to problems set by the Company Commander and to decide exactly how they would overcome various obstacles. Tank crews should be taken on foot around the training area in all weather conditions to identify likely enemy MG posts. Practice in laying out the routes of deployment needed to be practiced by day and night. Training with infantry should be carried out to ensure that they followed the tanks and not preceded them.⁶⁷

Swinton produced some further ‘hints on the use of tanks’ on 27 July 1916 for ‘circulation amongst those who will have control of them in action’. These included observations by Captain Martel, the GSO3 at Tank HQ. In the light of his experiences on 1 July 1916, Martel thought it ‘absolutely imperative’ that the ‘hush-hushes’ should be used without the usual preliminary bombardment. He did not think the ‘hush-hushes’ would be in any danger of counter bombardment in the German front line trenches and that they could therefore precede the infantry. He also recommended that the tank should not proceed from the first line until all Germans had been mopped up in their deep dug-outs. Swinton’s letter included a single page of ‘Tank Tips’ obviously written for the benefit of tank commanders, although it is not known if the tips ever made it to the battlefield.⁶⁸

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KCL Fuller papers I/3/1 ‘The Handling of the Heavy Section, Machine Gun Corps’, July 1916

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TNA; WO 32/5754: Fourth Army Operations: Swinton to DSD, 27 July 1916

All these various views were coalesced into a succinct paper issued by Major-General Launcelot Kiggell, CGS at GHQ, on 16 August 1916. It was sent personally to the commanders of the Fourth and Reserve Armies as they began their planning for the forthcoming September offensive. The covering letter gave a brief summary of the C-in-C's intentions, listed the characteristics of the tank and invited the two commanders to consider how they could best employ the new weapons. Kiggell listed a number of points for consideration by the commanders and emphasised that 'the objectives of the "tanks" must be clearly stated and as simple as possible, as it is difficult for the "tanks" to manoeuvre'.⁶⁹

The paper reiterated the primary object of the tank; 'to help the infantry forward and especially to deal with enemy machine guns.' It realistically pointed out that the original concept of an advance in line of large numbers of machines involving 'an approach march and deployment under cover, a surprise start, accurate keeping of alignment and direction.....renders this a difficult operation'. It cautioned that 'a tank cannot, except at great risk, cross a heavy barrage of H.E. or gas shells and it cannot lie out in the open under shell fire'. The employment of the tanks would be limited 'unless we are prepared to risk the loss of all the tanks by pushing them as far forward as they can go, if possible right through to the enemy's gun positions'.⁷⁰

By the time the guidance was issued it was clear that large numbers of tanks would not be available for their first deployment and the document therefore outlines a number of ways the limited number of tanks could be employed:

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TNA: WO 158/235/172: Fourth Army Operations: Kiggell, 16 August 1916. Also reproduced as Appendix 15, Miles, *OH, 1916*, (1)

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TNA: WO32/5754: *Preliminary Notes on Tactical Employment of Tanks (Provisional)*. 16 August 1916. Also reproduced as Appendix 15, Miles, *OH, 1916*, (1)

- (a) The advance in line in large numbers;
- (b) The attack in groups, or pairs, against selected objectives;
- (c) Employment singly, or in pairs, for special purposes;
- (d) Employment as mobile light artillery

The document ends on a cautious but realistic note:

The tank is a novel engine of war, and untried. Its use will require careful study and preparation on each separate occasion...every attack by tanks must be combined with an infantry attack and it will be the special duty of the infantry to co-operate closely with the tanks...

It is not known who the author of the document was, possibly Kiggell himself, but it is clear that the document does not take Swinton's original proposals at face value. It is a more thoughtful and considered appraisal of the limitations of the new weapon as well as of its potential. It is an important document in that it encapsulates GHQ's views on the tactical employment of tanks on the eve of their debut on the Somme in September 1916. It illustrates the fact that elements of GHQ had given some considerable thought to the practical use of this new addition to its armoury. The document could be criticised for being unduly cautious but, on balance, the author was pointing out the known limitations of the new weapon which had not at this stage been tested in combat.

What is remarkable is that in the very short period between the first appearance of an entirely new weapon of war in February 1916 to its first deployment in September, a body of tactical doctrine had emerged, been refined and disseminated to the commanders involved. All this was done against a background of uncertainty as to how many weapons would be available and how they would actually perform, with the added constraint of maintaining secrecy. In addition, the headquarters staff were facing other considerable pressures at the time.

Meanwhile, Swinton, the man charged with both finding and training the crews had very limited time and resources in which to do so.

EARLY TRAINING

First, authority had to be sought for the formation and organisation of the new 'corps'. At a WO conference held on 14 February 1916 attended by the Director of Operations, and representatives of the Staff Duties, Adjutant General and Finance branches, it was recommended that the new 'tank detachment' should form part of the Motor Machine Gun Service [MMGS] of the MGC, as no further MMGS batteries were being formed. The committee felt it unlikely that many RNAS personnel would transfer from 20 Squadron into the MGC as the rates of pay were inferior. It was more likely that personnel would come from the MMGS.⁷¹ On 17 March 1916, Swinton was approved as the commander of the 'special Corps' which was to be located in part of the barracks at Bisley occupied by the MMGC Training Centre. The need for secrecy was again emphasised and all matters regarding training and resources were to be addressed directly and confidentially to the Staff Duties branch at War Office.⁷² On 1 May 1916, the WO confirmed that the 'Tank Detachment' of the MGC would be renamed the 'Heavy Section, Machine Gun Corps' in order to preserve the secret nature of the unit.⁷³

Initially, Swinton wanted the unit organised into three battalions each of five companies of two sections with six tanks apiece. GHQ rejected this idea and wanted a company to be an independent tactical unit.⁷⁴ So the organisation was set at six

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TNA: WO32/5754/6: Army Organisation: Formation of a Detachment of the MMGC: Conference, 14 February 1916

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TNA: WO32/5754: Army Organisation: Formation of a Detachment of the MMGC: Major-General Whigham to the C-in-C Home Forces, 17 March 1916

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TNA: WO32/5754: Army Organisation: Formation of a Detachment of the MMGC: WO to C-in-C Home Forces, 1 May 1916

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companies each with 25 tanks in four sections of six tanks and a spare. This organisation required an establishment of 184 officers and 1,610 other ranks.⁷⁵

Attention turned to the recruitment of officers and men. Swinton had recommended that the officers and men would be 'trained at home ... to steer and operate over an imitation British and German trench zone by the aid of trench maps similar to our aeroplane maps of the German defensive positions.'⁷⁶ Confidential letters were sent out in January 1916 to the COs of Special Reserve and Training Regiments in the UK for officer volunteers. Officers had to be under 25 and capable of driving cars. No particular requirements appear to have been laid down for the NCOs and soldiers although a number of ASC MT drivers who had worked on the experimental Admiralty machines elected to transfer.

The former commander of the MMGC, Lieutenant-Colonel Bradley, transferred as Swinton's Second-in-Command. In April, he and Swinton made a tour of officer cadet units, in particular the 18th, 19th and 20th (Public Schools) Battalions of the Royal Fusiliers, to spot potential officers with some mechanical experience.⁷⁷ They even enlisted the help of the popular magazine, *The Motor Cycle*, to attract men from the motor engineering trades.⁷⁸ Some personnel from the MMGC transferred into the new unit but not a single man of 20 Squadron RNAS

No reason was given for this decision. It is possible that, at this stage, GHQ regarded a company of tanks as a tactical addition to an infantry unit rather than part of a newly-created, independent organisation.

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Liddell Hart, *Tanks* (1), p.55

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Swinton, "Notes on the Employment of Tanks"

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William-Ellis, C & A., *The Tank Corps* (Country Life, 1919), p.16.

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Liddell Hart, *Tanks* (1), p.54.

volunteered to join. This was hardly surprising when Naval pay was almost three times that being offered by the Army.

Training was carried out initially at Siberia Camp, Bisley, the former training centre of the MMGC. Two new companies of the MGC were formed, K and L, which together formed the Heavy Section MGC. No tanks were yet available to train on, so training concentrated on the weapons; the Vickers and Hotchkiss machine guns and the Hotchkiss 6 pounder QF gun. Captain D.G. Browne, who joined the Tank Corps around this time, described those early days at Bisley:

There being as yet no tanks available for training purposes, the programme of work at Bisley was limited virtually to drill and courses on the Hotchkiss guns. It would be absurd to pretend that any of this was taken very seriously... the new formation suffered inevitably from a lack of competent and energetic senior officers... Of the subaltern officers probably about 75 per cent represented as good material as could be found anywhere- a high proportion, in view of the extraordinary and haphazard processes by which the commissioned ranks of the New Army were filled, and one that compared favourably with that of most infantry units.⁷⁹

One of the first officers to volunteer, Lieutenant Raikes of the South Wales Borderers, met his section of recruits for the first time in April 1916. They were mainly men from a wide variety of backgrounds who had enlisted under the 'Derby' recruiting scheme and 'no attempt had been made to pick men with mechanical experience or who could even drive a lorry!' They were taught how to handle the Hotchkiss and Vickers Machine Guns and the 6 pounder gun at Bisley and with the Navy at Portsmouth. Their first encounter with an actual tank was not until June when part of the HS had moved to Thetford to conduct its training there in greater secrecy. They then had less than two-and-a-half months to learn how to drive and maintain the machines before going into action for the first time in September 1916. Raikes remarked:

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Browne, Captain D.G., *The Tanks in Action* (Blackwood, 1920), p.24.

It is amusing to think that the first tanks were actually taken into action by men who had not been in the Army for more than four months although a lot of the Officers had seen service in France before.⁸⁰

The training facilities at Bisley proved to be unsuitable. The training area was not sufficiently remote to provide necessary security. Attempts to fire practice rounds from the borrowed 6-pounders proved dangerous when the shots strayed outside the range boundary. As a result, the 6-pounder practice had to be carried out on the Naval ranges at Portsmouth and Chatham and on the artillery ranges at Larkhill. Firing practice at sea with the Navy proved useful training for moving target practice from the tanks.⁸¹

A more suitable, remote area was sought and found on Lord Iveagh's estate at Elveden, near Thetford in Norfolk, to which the HS began to move in June. A secure training area was created with a branch railway line to receive and despatch tanks. A practice area was constructed:

The area was turned into an imitation of the trench front in France... this practice battlefield was designed by Captain G. LeQ. Martel RE, who was sent over by GHQ for the purpose and constructed by three Pioneer battalions. The 'section' was one and a half miles in width and in depth embraced the British support and front line, No Man's Land and the German first, second and third lines. It included all forms of obstacle and entrenchments likely to be met in the enemy's defensive zone.⁸²

Delays in the production of tanks meant that driver training could not start until the arrival of the first batch in mid June. 'The men were both clever and keen, and the most serious trouble was the insufficient supply of tanks on which to train them. Many drivers had spent no more than an hour or two in a tank before they left

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TM: E2007.241: Raikes, Colonel, Letter to *Tank Journal*, 8 January 1951

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Liddell Hart, *Tanks*, (1), p.55

⁸²

Ibid, p.56

for France.⁸³ The imperative from GHQ was to use whatever tanks were available for an offensive in mid-September. Even when a few arrived in late June, there remained the problem of what form the instruction should take, other than the mechanical and gunnery skills.

It would be difficult to over-estimate the difficulties which confronted those officers responsible for the preliminary training of the Heavy Section of the Machine Gun Section; no-one had actually fought inside a Tank...There was no manual to guide them.⁸⁴

Training concentrated on mechanical knowledge of the tank and peculiarities of particular vehicles; thorough knowledge of the 6 pounder gun and MGs; crew duties; physical fitness and revolver shooting. Some aspects were not covered either through lack of time, lack of resources or lack of knowledge of what was needed:

We had no reconnaissance or map reading...no practices or lectures on the compass...we had no signalling...and no practice in considering orders...We had no knowledge of where to look for information that would be necessary for us as Tank Commanders, nor did we know what information we should be likely to require. We had no signalling and only one day revolver drill and one day revolver shooting on the range. In England we were issued with goggles and the old type of the gas helmets but the men never had a gas drill and did not know how to put on their helmets and goggle when we got to France. Nearly all these things would have been rectified had we had longer time in which to do the training which was on the syllabus. Perhaps the most important point of all is that we had only once fired from a moving tank... I cannot emphasise too strongly how much I feel that it is essential that the crew and Tank Commander should fire from a moving tank at unknown targets.⁸⁵

Swinton was under constant pressure from GHQ to provide more tanks and trained personnel. In April, GHQ had increased their order to 150 tanks and,

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Browne, *Tanks in Action*, p.27

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Williams-Ellis, *Tank Corps*, p. 19

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TM: E2007.551: Henriques, Lieutenant B L Q, *Lecture on the Attack on the Quadrilateral*, Bovington Camp, 6 March 1917.

following a meeting in London with Haig on 14 April 1916, Swinton was invited to produce these tanks by June for the planned Somme offensive. This was an entirely unrealistic request and on 26 April 1916 Swinton wrote to GHQ to explain the supply position, stating: 'it is best to be categorical as to what we expect can or cannot be done, and so as to avoid disappointment and the reversal of plans'. He explained that no tanks would be ready by 1 June, that some tanks would be available by July but these would not be suitable for combat (they were non-armoured Mk 1s designed for training only). He thought that all tanks would be ready by 1 August, 'strikes and Acts of God excepted', and that 75 trained crews would be ready by then, provided sufficient tanks were received on which to train.⁸⁶

On 15 May 1916 Swinton wrote again to Butler, the Deputy Chief of Staff at GHQ, stating that the supply position was unchanged and that he had got nearly all the officers he wanted and most of the men; MGs were arriving but there was a 'hitch' with 6-pounder ammunition. Driving was progressing slowly as he only had one tank, Big Willie, for training.⁸⁷ On 14 June 1916 he sent a detailed progress report to Butler. Having sent Stern to the manufacturing works at Lincoln to check on progress, he gave a breakdown of when he anticipated tanks would be ready for despatch to France. He was optimistic that all 150 would be ready, in batches, by the beginning of September, but there were delays in the supply of machine guns, 6-pounders and sponsons.

Training on the 6-pounders was limited by the fact that he had had to borrow five guns; four from the Navy and one from the Royal Military Academy, Woolwich,

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TNA: WO32/5754: Army Organisation: Formation of a Detachment of the MMGC:
Swinton to Butler, 26 April 1916

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TNA: WO32/5754: Army Organisation: Formation of a Detachment of the MMGC:
Swinton to Butler, 15 May 1916

and even these had different mountings. He had difficulty finding suitable ranges but hoped that problem would be solved when the entire unit moved to Elveden. Driver training was progressing but with only one tank, progress was slow. He anticipated getting another 25 tanks by the end of July which would coincide with the completion of the practice battlefield. At that point three companies would be located at Elveden and tactical training could begin in earnest. In practice, as Swinton later recorded:

There was no time for practicing the Tanks in accordance with any elaborate tactical scheme. All that could be taught was the art of manoeuvring together with the straightforward object of searching out and destroying machine guns emplaced in every kind of artfully concealed position. Had there been time the next step would have been combined operations with the infantry.⁸⁸

By 21 July, training had advanced to the extent that a tactical demonstration using 25 tanks could be held at Elveden for the benefit of the CIGS, representatives from GHQ, and Lloyd George, the new Secretary of State for War. On 8 August 1916, Swinton reported to DSD that because of problems with the delivery of 'accessories [guns and sponsons] and spares' which would not be available until 1 September, tanks that had already been sent to France could not be used in battle although they would be suitable for training with the infantry.⁸⁹

Three companies of tanks were allocated to the September offensive. The first company of tanks was sent to France on 13 August 1916 in two batches. The tanks were in such a poor state of maintenance, having been used continuously for training, that they were only got battle-ready with the help of a large volunteer party of fitters sent from the manufacturers. The companies went first to an improvised training facility at Yvrench then onto a concentration area at The Loop close to the

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Swinton, Ernest. *Eyewitness* (Hodder & Stoughton, 1932), p.272

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TNA: WO32/5754: Army Organisation: Formation of a Detachment of the MMGC: Swinton to DSD. 6 August 1916

front. A second company followed in late August arriving just two days before the planned attack. The third company arrived in France too late to take part in the attack.

The precious little time available for further training, critically with their supporting battalions, was curtailed by essential battle preparations and constant demonstrations of the new weapon to 'embarrassing numbers' of Staff Officers and curious on-lookers.⁹⁰

Meanwhile, the Tank crews and commanders had been enjoying three or four days of almost comically complete nightmare. In the first place they had all manner of mechanical preoccupations - newly arrived spare engine parts to test, new guns to adjust, box respirators to struggle with, and an astonishing amount of "battle luggage" to stow away. But worst of all they found themselves regarded as the star variety-turn of the Western Front. At Yvrench they had performed in front of General Joffre, Sir Douglas Haig and the greater part of the GHQ staff.⁹¹

Swinton commented:

Some of the machines were asked to force their way through a wood and knock down trees - tricks which they had not been designed to play and which were likely to damage them seriously. I protested against these 'stunts' and the frequent exhibitions, which were wearing out both machines and personnel. In addition to the almost continuous work of repairing, leaning and tuning up their Tanks, the men barely had time to eat sleep and tend themselves. I speculated as to how many machines would be one hundred per cent to go into action when the day arrived.⁹²

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Miles, *OH*, 1916, (1), p.296

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Williams-Ellis, *Tank Corps*, p.26. The Tank Commander quoted by Williams Ellis was Lieutenant B L Q Henriques and is from Henriques' *Lecture on the Attack on the Quadrilateral* to aspiring tank battalion, company and section commanders at Bovington on 6 March 1917. TM: E2007.551

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Swinton, *Eyewitness*, p.279

At a demonstration with 7 Middlesex on 26 August Haig made his prescient remark:⁹³ 'Altogether the demonstration was quite encouraging, but we require to clear our ideas as to the tactical handling of these machines.'⁹⁴

On 13 September 1916, the tanks moved out of the concentration area at the Loop to their assembly areas and the following night to their starting locations just behind the front-line. It was a salutary experience for the debut of the tank. Exhausted crews, and for many it was their first experience of a battlefield, faced the reality of two, short night moves across muddy, shell-cratered ground. At this stage, reconnaissance and planning of routes for the tanks was the responsibility of the supporting divisional staff. 'It is to be feared that in many cases young and inexperienced tank commanders found themselves overburdened with directions and instructions, which, in many cases, had to be memorised, as there were not enough copies to go around.'⁹⁵ Only 36 of the 49 tanks reached their starting points for the attack the following morning.

CONCLUSION

On 15 September 1916 British tanks went into action for the first time. The results of that engagement, the lessons learnt and their influence on future tactical and operational employment doctrine and training will be examined in subsequent chapters. The eve of battle, however, is a convenient moment to take stock of the

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TNA: WO95/2950: War Diary, 7th Middlesex, 26 August 1916

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TNA: WO256/12.:Diaries of Field Marshal Sir Douglas Haig, entry 26 August 1916

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Miles, *OH*, 1916 (1), p.297, fn.2

evolution of tactical doctrine and the progress in the training of commanders and crews in the eight months between the first appearance of a practical armoured fighting vehicle in February and its deployment in September 1916.

Did the commanders involved, namely the C-in-C, Haig; the GOC Fourth Army, Rawlinson and, to a lesser extent, Gough of Reserve Army, have sufficient knowledge and guidance in the tactical use of the new weapon? Credit must be given to Swinton for his tireless efforts to produce a workable body of doctrine for the employment of the tanks. In addition to his early unofficial and verbal lobbying, Swinton produced no less than three substantive memoranda on the subject, the last in July 1916. He sought the views of other experienced commentators and sent a staff officer to GHQ to elicit their views. His recommendations were eventually amended and condensed, by GHQ, into the Notes sent to the two Army commanders in mid-August, giving them just over a month to prepare their plans for the offensive and the part that the tanks were to play in it. Rawlinson planned for the use of the small number of tanks allocated to him but in 'penny packets' of two and three tanks to help achieve his 'bite and hold' objectives. Haig, however, saw the tanks as an opportunity to achieve the breakthrough that he desperately wanted and encouraged Rawlinson to make a bolder use of the tanks. By the time Rawlinson's amended plan was approved at the beginning of September, there was just over two weeks before the start of the offensive. Arguably this was insufficient time to promulgate plans and orders down through the chain of command to the battalions and tank companies to allow for effective combined infantry and tank training.

Were the tank crews and commanders sufficiently well trained for the task? Swinton had the unenviable task of not only setting up the new unit, recruiting officers and men for it, writing the tactical doctrine, acting as a liaison between the demands of GHQ for more tanks and the realities of supply from the manufacturers,

agreeing modifications and improvements to the vehicles, finding a suitable training area and in addition supervising the training of the crews and commanders with insufficient resources. Swinton was consistently hampered in the training of his unit by lack of vehicles to train on. It wasn't until July that sufficient vehicles had been produced to begin driver training in earnest, resulting in some cases, of drivers having had only two or three hours experience before going into combat. Gunnery training was also restricted by lack of guns on which to train. Some essential aspects, such as vehicle maintenance and navigation, were barely covered in the time available. The question of communications between tanks and the supporting infantry was unresolved. Above all was the inevitable problem of lack of practical experience . There is little doubt that the crews were not adequately trained, despite the best efforts of Swinton and his staff.

Finally, there is the question of whether Haig was right to commit so few tanks to battle. 50 tanks were sent to France with 10 in reserve. On the eve of battle on the 18 September 1916, 49 were available for the attack of which only 36 arrived at their starting points, the remainder having broken down through mechanical problems or ditching. This was far short of the 150 tanks that Haig had requested in April. Following the disastrous results on the first day of the Somme offensive and subsequent actions, and facing criticism from home and pressure from the French, Haig persisted in the use of whatever tanks were available to achieve a breakthrough in September.

Haig was under pressure from the CIGS, encouraged by Lloyd George, to delay the introduction of the tank until the following spring when many more would be available and there would be sufficient time and resources for training.

While there is no question of dictating to you the methods to be employed in the use of this new weapon, The Secretary of State feels that the decision as to whether to employ a small number at once and to send out further Tanks

as they become available or to wait until a large number can be placed in the field at one time is one of great importance upon which he would be glad to have your views as soon as possible.⁹⁶

In a somewhat terse response to Robertson, Haig replied that:

I am fully alive to the disadvantages of using the tanks before the full number on order are available... if opportunity should offer to gain valuable results in the present struggle by the use of even a few tanks, I should have no hesitation in taking advantage of it, and I consider it of very great importance that such small number of tanks as can be made available should be sent to France without delay... it is not my intention to employ tanks in small numbers unless and until I am convinced that the advantages to be gained by doing so are great enough to outweigh the disadvantages of making known to the enemy the existence of these new weapons of war.⁹⁷

Nonetheless, he wrote to Robertson, on 22 August:

Even if I do not get so many as I hope, I shall use what I have got, as I cannot wait any longer for them, and it would be folly not to use any means at my disposal in what is likely to be our crowning effort for this year.⁹⁸

In conclusion, the premature use of the tanks was not entirely negative. Liddell Hart contended that:

Whilst the disadvantages of introducing this 'secret weapon' on such a petty scale are obvious, it can be argued that this premature disclosure had a compensating advantage in the experience gained, and the time it gained for improvements to be made in the light of lessons learnt. Some of the most senior officers in the wartime Tank Corps considered, in retrospect, that on balance the benefit outweighed the forfeit.⁹⁹

Haig was under considerable pressure to demonstrate success to his allies and critics at home. As it was unlikely that the secret of the tanks could have been maintained until the following spring, Haig was probably correct in using them when he did.

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⁹⁷ TNA: WO158/843: Correspondence HS MGC: Robertson to Haig, 25 July 1916

⁹⁸ TNA: WO158/843: Correspondence HS MGC: Haig to Robertson, 29 July 1916

⁹⁹ Haig to Robertson, 22 August 1916 quoted in Miles, *OH, 1916 (1)*, pp.234- 235

Liddell Hart, *Tanks*, (1)p.67

CHAPTER TWO - FIRST ENGAGEMENTS, LESSONS LEARNT AND GROWTH OF THE TANK TRAINING ORGANISATION

FIRST ENGAGEMENTS

On 16 August 1916, Kiggell, Haig's Chief of Staff, wrote personally to the commanders of Fourth and Reserve Armies, advising them that they could expect to have between 50 or 60 tanks available for the coming operations. He included a note detailing the characteristics of the new weapon. He outlined the C-in-C's intentions for the operations and emphasised that:

As time is short, it is of paramount importance that Army and Corps Commanders should study the use of these "tanks" with the actual problem which will confront them on the ground.

He listed six points for consideration in the use of the tanks:

- (a) Assembly places under cover. These should not be difficult to find behind the ridge we at present occupy.
- (b) Their use with infantry. It will be especially necessary to train the divisions who may be earmarked to work with the "tanks".
- (c) Although the recommendation is that the tanks should be 100 to 200 yards apart, it may probably suffice, in view of the nature of the German defences opposite us, to use these "tanks" at a wider interval, from 200 to 250 yards apart.
- (d) One section of "tanks" would thus appear to be a suitable distribution for an infantry division covering 1,200 to 1,500 yards of front.
- (e) The infantry will have to work close behind the "tanks", occupying, clearing out and consolidating successive positions soon after they have been reached by the "tanks". Some tanks might be required to work with the infantry in clearing up strong points overrun by the leading tanks and troops.
- (f) The working of our artillery barrage in conjunction with the "tanks" will require careful consideration.

Kiggell concluded by emphasising that:

the objectives of the “tanks” must be clearly stated and as simple as possible, as it is difficult for the “tanks” to manoeuvre.¹⁰⁰

Kiggell's note to the commanders was, in effect, a form of tactical doctrine, but it was not prescriptive in the sense of laying down procedures that had to be followed by commanders. It was in line with contemporary doctrinal practice in the British Army whereby the senior commander stated his intention but left the subordinate commander to plan the ways and means of achieving it. This encouraged initiative, speed of response and decentralised decision making at the lower command level, albeit subject to the ultimate, overall responsibility of the senior commander.¹⁰¹ At this stage, with no experience of the use of the tanks in battle to go on, Kiggell could only issue general guidance to the commanders; hence the use of such phrases as: ‘it may probably suffice’, ‘would thus appear’, ‘might be required’ and ‘will require careful consideration’.

On 28 August, General Rawlinson, commander of Fourth Army, submitted his plans for the September offensive to Haig. Rawlinson argued that, in normal circumstance, i.e. without the use of tanks, capture of the enemy's first defence line would be perfectly possible given the troops at his disposal, but that capture of the second and third lines would require a pause of several days to enable the artillery to come forward. The presence of tanks, however, raised a number of issues. Should they be used simply to assist in taking the first line of defences or, if they failed to take the further defences, would the vital advantage of surprise of the use of the new weapon be lost? He contended that:

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TNA: WO158/235/172: Fourth Army Correspondence: Kiggell to Fourth and Reserve Army Commanders, 16 August 1916 also Miles, *OH*, 1916, (2), Appx.15

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For the development of pre-war General Staff training, see Brian Bond, *The Victorian Army and the Staff College* (Methuen, 1972), also Martin van Creveld, *Command in War*. (Cambridge, Mass: Harvard University Press, 1987), pp.149-150. In modern military terminology, this is termed ‘mission command’

Till the enemy know exactly what they have to deal with they cannot arrange or prepare an antidote. We must therefore endeavour to keep them [the tanks] a mystery as long as possible. The really important question for decision therefore is how we can best do this.

Rawlinson proposed that the available tanks should be used in small packets of 1 or 1½ sections (i.e. 6 to 9 tanks) spread around the attacking divisions. He suggested that not too much should be expected of the tanks initially and that they should be used just to take the first line of defences. They would advance by night, under moonlight, to assist the infantry in taking the first line then withdraw under cover of darkness before the Germans realised what had hit them. The whole process would then be repeated on the following nights to take the further defences.¹⁰²

It is clear from Haig's pencilled notes on Rawlinson's original document that he was not happy with Rawlinson's somewhat cautious, step-by-step, 'bite and hold' plan. There was a long-standing disagreement between Haig and Rawlinson over his conduct of operations dating back at least to the battles of 1915.¹⁰³ Haig questioned whether it would be possible to carry out the operation during darkness and bring all the tanks back safely to be used again the following night. He was worried that numbers might be left out in no-mans'-land in daylight and be destroyed or captured. He anticipated taking all three defence lines in the initial assault opening the gap for the five cavalry divisions to exploit. He wanted 'greater boldness shown from the outset... so use tanks boldly, press success, demoralise enemy and try to capture his guns.'¹⁰⁴

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103 TNA: WO158/235/188: Fourth Army Correspondence: Rawlinson, 28 August 1916

104 See Gary Sheffield, *The Chief* (Aurum Press, 2012 [2011]) pp.109-111.

TNA: WO158/235/188: Fourth Army Correspondence: Pencilled notes by Haig on Rawlinson's proposal, 29 August 1916

Kiggell sent a further instruction to Rawlinson on 31 August 1916, enclosing Haig's hand-written intentions for the coming offensive.¹⁰⁵ Kiggell made it clear that the C-in-C wanted the tanks to be used more boldly to achieve the breakthrough he desired as soon as possible, exploiting the element of surprise of the new weapon.¹⁰⁶

Rawlinson duly submitted a 'fresh plan' to GHQ the same day.¹⁰⁷ He did not argue with Haig's proposals and adjusted his plan accordingly.¹⁰⁸ In the artillery plan, however, there was a modification to the barrage plan which dramatically affected the fortunes of both the tanks and the supporting infantry. Rawlinson was concerned about the rate of advance of the tanks compared with the infantry. There could be two consequences; either the infantry would arrive at the first objective ahead of the tanks and not benefit from their support, or, alternatively, if the tanks arrived before the infantry, the tanks risked being hit by the friendly barrage advancing in front of the infantry. Rawlinson therefore planned to leave artillery-free 'lanes' of about 100 yards wide, along which the tanks would advance on the hostile MG posts.¹⁰⁹ This decision proved heavy in terms of casualties to both tanks and infantry.

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TNA: WO158/235/190: Fourth Army Correspondence: Kiggell to Rawlinson, 31 August 1916

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TNA: WO158/235/189: Fourth Army Operations; Haig's handwritten 'Notes on September Offensive', 29 August 1916.

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¹⁰⁸ TNA: WO158/235/198: Fourth Army Operations; Rawlinson. 31 August 1916

See Sheffield, *The Chief*, pp.167-169. Sheffield suggests that Rawlinson acceded to Haig's views but deliberately ignored them in his subsequent conduct of operations.

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See Miles, *OH*, 1916 (2), appx.23. Some lanes were increased considerably in width on the advice of Artillery Commanders.

On their debut on 15 September 1916, the tanks achieved limited and mixed success. Of the 36 tanks that made it to the assembly positions, mechanical problems further reduced the numbers to the 30 that actually crossed the start line. Of these, five became ditched and nine broke down with mechanical problems. The remaining 16 were used in the 'dribblets' that Swinton had cautioned against.¹¹⁰ The only significant success was in the centre of XV Corps where seven tanks led an attack by a British and the New Zealand Division on the village of Flers. Even here, four tanks were knocked out by direct artillery fire whilst the remaining three penetrated into the centre of the village accompanied by parties of infantry who found that the German defenders had fled in panic. According to the Official History, 'less than a dozen tanks played a part in the capture of strong points and trenches, although in certain localities the moral effect of the new engine of warfare was considerable.'¹¹¹

Further attempts to use the surviving tanks followed. On 25 September 1916, on an attack on Gueudecourt, a solitary tank destroyed a field gun battery, captured a mile of trenches and 400 prisoners, enabling the infantry to capture the objective, all in under an hour. In mid-November, 52 tanks, including many recovered from the battlefield, were assembled for an attack on Beaumont-Hamel, the last remaining strongpoint on the northern end of the Somme sector. Due to poor ground conditions and bad weather only eight of these could be brought into action.

LESSONS LEARNT

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See fn.2, p.6

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Miles, *OH*, 1916, (2), p.364

At the beginning of October, GHQ invited the participants to comment on their performance. GHQ consolidated the comments and circulated them to all five Armies in the BEF. *GHQ Notes on the Use of Tanks* produced by Advanced GHQ on 5 October 1916 included the following comments:

In the present stage of their development they must be regarded as entirely accessory to the ordinary methods of attack i.e., to the advance of infantry in close cooperation with Artillery.

In cases where they have reached a hostile trench a little ahead of the Infantry they have undoubtedly done valuable service. Their moral effect on the enemy's infantry has been considerable. They have also not only drawn a great deal of the hostile machine gun and rifle fire on themselves, and therefore off the attacking infantry, but have also been able to cause considerable loss to the enemy in the trench, to knock out in many cases his machine guns and... to bring about the enemy's surrender or retirement.

The decision to leave the 'artillery free' lanes was criticised:

In the Fourth Army an attempt was made... by leaving lanes in the barrage up which the tanks moved; so far as this attempt failed the cause of failure appears to have been due to the breakdown of several Tanks and consequently to there being lanes in the barrage up which no tanks were moving.

Tanks exposed while stationary to the enemy's artillery are likely to be soon knocked out. The number of Tanks actually knocked out by hostile artillery... has so far been very small as compared with the number which broke down owing to mechanical trouble.¹¹²

Some commentators, Liddell Hart in particular, interpreted these comments to show a 'reserved verdict' by GHQ.¹¹³ It seems more likely that they were a cautious and realistic summary of the results of the first use of an untried weapon of war with suggestions for improvements based on practical experience.

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TNA: WO158/236: Fourth Army Correspondence: *GHQ Notes on the Use of Tanks*, 5 October 1916

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See Liddell Hart, *Tanks (1)*, p.81

Some after-action reports were initiated at a lower command level. On 13 October 1916, for instance, Fourth Army issued a memorandum summarising the 'causes for non-success of the Fourth Army attack on 12 October 1916' which was circulated, not only amongst its own Corps, but to flanking Armies including the French Sixth Army.¹¹⁴ Hammond argues that

From these after-action reports, conclusions (although not necessarily the 'correct' ones) were drawn and incorporated into subsequent training and doctrinal publications. This was a sound and valuable process. However, it should not be taken as implying rigid, centralised control of tactical development.

Thus, for example, when Kiggell's *Notes* were circulated they were specifically designed ... to inform and educate but not to dictate. It was information based on combat experience and was not theoretical. These *Notes* constituted the first steps in learning the lessons of tank fighting and the beginning of a continual cycle of action, review and refinement that was maintained until well after the war had ended.¹¹⁵

Whilst Hammond's views might be true of the development of tactical doctrine in the British Army as a whole, within the confines of the Tank Corps, a much smaller organisation, it could be argued that operational and tactical development was more rigidly controlled. This process will be examined later in the thesis.

In general, the lessons learnt from the Somme actions could be summarised as follows. First, the mechanical unreliability of the vehicles directly resulted in a large number of tanks either failing to make it to the start line or, once committed to battle, breaking down whilst in action. Many were worn out by the intensive pre-battle training and none had been tested in battle. Facilities for the recovery and repair of 'battlefield casualty' tanks and the provision of spares were practically non-existent.

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TNA: WO158/236: Fourth Army Correspondence: Memorandum, 13 October 1916

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Bryn Hammond, 'Practical Considerations in British Tank Operations on the Western Front', in Alaric Searle (ed.), *Genesis, Employment, Aftermath: First World War Tanks and the New Warfare, 1900-1945* (Helion: Solihull, 2015), pp.46-50

Second, crews were inadequately trained in many aspects of handling the vehicles. In addition, because of time constraints, little or no co-operative training of the handling of the tanks with the supporting units had been possible before operations commenced. Furthermore, largely because of the need to maintain secrecy, higher level commanders had little appreciation of the capabilities – and constraints- of the tactical use of the new weapon.

Third, at the operational level, the decision to use the available tanks in 'dribbles' or 'penny-packets', contrary to the advice given by Swinton, contributed to their failure. Rawlinson's modified plan depended in many key aspects on the success of the various tank actions. When these failed, his plan inevitably suffered. It became clear that tanks were not physically capable of traversing ground cratered by a sustained artillery bombardment. The decision by GOC III Corps, Lieutenant-General Sir William Pulteney, to send tanks through High Wood against the advice of the tank officers and the Divisional Commander showed a fundamental misappreciation of their cross-country capabilities.¹¹⁶ In addition, too little consideration was given to the necessary co-ordination required between the infantry and artillery plans and the tank actions. In particular, the artillery-free lanes contributed significantly to the tank, and infantry, battlefield casualties.

It could be argued that, aside from the factors mentioned above, the tanks available at the time, given their limitations in terms of reliability, speed, manoeuvrability, protection and firepower, would not have achieved much more than they did, even had sufficient numbers been available. What they had shown, to a somewhat sceptical audience, was their potential for future use once the various shortcomings were resolved.

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Liddell Hart, *Tanks*, (1), p.75

Not all the results were negative: 'in perfecting and exploiting a new weapon it is wise to proceed by a process of trial and error both on the testing ground and in the field: one can hardly expect to arrive at sound tactical methods by theory alone.'¹¹⁷ Arguably, one long term result of the tanks initial introduction in September 1916 was the effect on the Germans' attitude to the potential of tanks as a weapon of war. Having witnessed the limited success of the tanks on the Somme, the Germans made little effort to pursue the idea themselves although they did produce effective anti-armour projectiles for use by their infantry and artillery, although this reluctance may have resulted as much from economic and political factors.¹¹⁸

GROWTH OF THE TRAINING ORGANISATION

Despite a general lack of enthusiasm and some degree of scepticism among the staff at GHQ about the utility of the tanks, Haig nonetheless felt the weapon had potential. He had invited both Swinton and Stern to GHQ to witness the debut of the tanks on 15 August and two days later he announced that he intended placing an order for a further 1,000 tanks.¹¹⁹ A number of other matters needed to be resolved both in France and Britain, such as the command and administration of the Heavy Branch, revised establishment, recruitment of additional personnel and creation of

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Miles, *OH*, 1916, (2), p.366

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See Ralf Rath, 'From the *Bremerwagen* to the A7V: German tank production and Armoured Warfare, 1916-1918', in Alaric Searle (ed.), *Genesis, Employment, Aftermath: First World War Tanks and the New Warfare, 1900-1945* (Solihull: Helion, 2015)

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TNA WO158/836. Fourth Army Operations: *Conference held on 19/29 September 1916*

training facilities. It became apparent that Haig did not want Swinton in command of the expanded Corps. Although there is no record other than Swinton's own account,¹²⁰ it seems that, despite his intimate involvement with the creation of the Heavy Branch and its baptism of fire in September 1916, Swinton no longer 'fitted in' to the revised organisation of the expanded corps. He was told by the CIGS: 'that France wanted a big expansion of the Heavy Section and that I was not considered to be the man to carry it out.'¹²¹

Swinton had previously recommended Lieutenant-Colonel Hugh Elles to be the commander of the HSMGC element in France: 'I could think of no-one more suitable, in spite of the fact that he knew as little about the tanks as his two predecessors did about the niceties of the current tactics in France.'¹²² Ironically, Elles ultimately replaced Swinton as commander of the Tank Corps following Elles's appointment as commander of the HSMGC in France on 29 September 1916.¹²³

The increase in the numbers of tanks required increases in establishments both in France and at Home. On 9 October 1916, GOC BEF suggested that the four companies then in France should be increased to six, formed into two battalions. On 20 October 1916, the WO demonstrated its faith in the future role of the tank by

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There are hints of War Office and GHQ's dissatisfaction with Swinton. A demi-official letter from Butler (DCGS at GHQ) to Elles states: 'I will tell you, for your information, that Swinton will not be remaining in the organisation, but keep this to yourself for the moment.' 22 September 1916, TNA: WO158/836. Similarly, a demi-official letter from Whigham to Butler states: 'The disposal of Swinton is a rather thorny problem which needs to be handled carefully', 29 September 1916. TNA:WO158/836.

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Swinton, *Eyewitness*, p.96

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Swinton quoted by Liddell Hart, *Tanks*, (1),p.82

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TNA: WO158/832:War Office Correspondence: Tank Corps: GHQ to all five Armies in the BEF, 29 September 1916

approving a more ambitious establishment of four battalions in France and five battalions At Home, each battalion was to have three companies of four fighting sections each of five tanks and a HQ section of four tanks giving a fighting strength of 72 tanks in each battalion.¹²⁴

The Heavy Branch was effectively split into two elements: the fighting organisation in France commanded by Elles and an administrative 'tail' in England.¹²⁵ In France, Elles was to be responsible for the tactical employment of the tank units in the field under the operational control of the C-in-C. He was also responsible for the advanced training of crews arriving from England. A tank workshop organisation was to be set up at the HQ in France and mobile workshops added to each battalion.¹²⁶

On 18 November 1916 Elles moved from Advanced GHQ at Beauquesne to set up a new tank headquarters in Bermicourt, near St Pol. The various tank units in France moved into billets in villages in the surrounding area and the process of expanding the existing companies into battalions began.¹²⁷

A confidential notice was circulated on 9 November 1916 around the BEF inviting applications for men to transfer into the Heavy Branch. Officers were required from battalion commanders down to tank commanders and from warrant officers down to private soldiers as tank crew, drivers and workshop mechanics. For

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TNA:WO158/604: War Office Correspondence: Tank Corps: WO to HQ Tanks, 20 October 1916

¹²⁵

The name of the Heavy Section was officially changed to Heavy Branch, MGC on the 16 November 1916 to reflect the formation of battalions from companies and to avoid confusion with the tank 'sections'. Liddell Hart, *Tanks*, (1), p.54

¹²⁶

¹²⁷ Williams Ellis, *Tank Corps*, p.42

Browne, *Tank in Action*, pp.51-56

tank crews the essential requirements were laid out as; 'good muscular development, a high standard of intelligence and good eyesight.' The desirable, but not essential, requirements were: 'mechanical knowledge and mechanical aptitude.'¹²⁸

With Swinton's departure, the WO asked GHQ for a nomination for the post of Superintendent of the Training Centre of the Heavy Section [Branch], MGC then being established at Wool (or Bovington) in Dorset.¹²⁹ The appointment of Brigadier-General Frederick Gore Anley on 20 October 1916, was something of surprise. Gore Anley was an experienced infantryman with no previous experience of tanks; indeed he is said to have professed to have no interest in them. It seems that he was appointed to 'sort out' the perceived lack of discipline among the volunteers gathering at Wool from a myriad of different units.¹³⁰ Gore Anley's duties were laid down by the DSD.¹³¹ He was to command the portion of the HSMGC in UK and be responsible for preliminary training and the supply of men, vehicles and spares to France. Initially, Gore Anley was to be located at the HSMGC's new base in Dorset, and a staff officer was to be based in London to keep the Army Council informed of the general requirements of the branch.

Five WO departments had responsibilities for the new organisation. DSD dealt with policy, organisation, establishments, and provision and training of Officer

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TNA: WO158/844-7: Correspondence HS MGC: Invitation to transfer into the MGC, 9 November 1916

¹²⁹

¹³⁰ TNA: WO158/844-2: Correspondence HS MGC: WO to GHQ BEF, 3 November 1916

¹³¹ Liddell Hart, Tanks, (1), p.83

TNA: WO158/844-:. Correspondence HS MGC: Memorandum, 8 November 1916

Cadets; AG9 with administration, officers and personnel; DTS dealt with transport, tanks and workshops and MOM supplied armaments and stores under the Director of Artillery.¹³² This dual and complex control of HSMGC in France and in England was not well thought out and unlikely to stand the test of combat.

The importance that Haig placed on the expansion of HSMGC was emphasised in a directive forwarded on 8 November to the various branches of GHQ and the commanders of the five Armies in France:

... the Commander-in-Chief wishes it to be known that he attaches considerable importance to this branch of the Machine Gun Corps being brought up to a high state of efficiency in personnel and equipment as soon as possible, and with this view he desires that every facility should be given to enable the expansion to be carried out rapidly, as the time for training of these units is already short.¹³³

Haig no doubt had in mind the need for tanks and crews for the coming spring offensive.

HSMGC began the move from Elveden to Wool on 27 October. The reasons for the move seemed to be that the training areas and gunnery ranges at Thetford were deemed to be inadequate. Also as the home establishment became more involved in the despatch of completed and tested tanks to the BEF, a location on the south coast closer to the Channel ports was desirable.

Wool Camp was an established hutted and tented camp then being used by convalescing Australian troops. It was situated in a relatively remote part of Dorset where secrecy and security could be maintained. As the War Diary of the 5th Battalion, described it: 'the wooded country around Bovington is particularly adapted to the training of tank battalions, the rolling downs, the woods and the small streets

¹³²

TNA: WO32/11393: Army Organisation: Report on progress of formation of HB MGC: Memorandum from DSD, 8 November 1916

¹³³

TNA: WO158/843: War Office Correspondence: GHQ: HS MGC: Kiggell to GHQ and Armies in BEF, 8 November 1916

being very similar to and as equally deserted as the battlefields of France.’¹³⁴ In addition, there were subsidiary camps nearby at Worgret (Wareham), Swanage, and Lulworth, which in due course were also taken over by the Tank Corps.

On 10 November, he outlined his plans to GHQ for the new Training Centre at Wool.¹³⁵ An organisational diagram showed the links between the WO and the HSMGC office in London, the HQ at Wool, the Supply Depot in England and the Tank Store in France. For training at Wool, Gore Anley envisaged a Chief Instructor responsible for technical instruction in four schools: tactics, driving, machine gun and gunnery. There would be five battalions of trainees with battalion commanders responsible for discipline and non-technical military training. Looking to the future, he stated: ‘Later on when the training at Wool is more advanced and the Officers and men have been individually instructed in Tank duties, and when we know better the requirements in France, I propose to alter training and train Companies and Battalions as Tank units.’¹³⁶

Gore Anley lost no time in organising the new training facility at Wool. The camp was officially inaugurated on 25 November 1915 and handed over to men from 711 Mechanical Transport Company, ASC from France, the unit that had supplied drivers for the tanks at Elveden and for the initial engagements on the Somme. These battle-experienced men provided the first driving instructors at Wool.¹³⁷ Various specialist schools were set up in the following weeks. The

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War Diary of 5th (E) Battalion quoted in *Tank Corps Journal*, Vol. 2 (14) (June 1920) p.48
¹³⁵

G E Lanning, ‘From Rifle Range to Garrison: An Essay on Bovington Camp (1899-1925)’ (Unpublished paper, 1970) in the Tank Museum library.
¹³⁶

TNA: WO158/844-5: War Office Correspondence: GHQ: HS MGC: Gore Anley to GHQ, 10 November 1916
¹³⁷

remaining 15 tanks sent from Elveden were in such a poor state of repair that most were returned to the manufacturers in batches for refurbishment before they could be used for training. Meanwhile, men recruited in France and the UK for the expanded Heavy Branch were arriving in such numbers that the existing Divisional Infantry camp at Worgret, near Wareham, was taken over as a Depot.

On 5 December 1916, Gore Anley sent a progress report to DSD. Five schools had been established at Wool: Tank Mechanism and Driving, 6-pounder Hotchkiss gun, Vickers and Hotchkiss Machine Guns and Physical Training classes. Gunnery practice was still being carried out on naval ranges at Chatham and Portsmouth and on the artillery ranges at Larkhill. He was awaiting the issue of Lewis guns to begin training on them. He was about to open a class on the use of compasses, using instructors trained by the Royal Navy. The shortage of training tanks meant the classes worked in three shifts throughout the day and night. Two of the five battalions were almost up to establishment and were being organised as tank units, the other three were only partly up to strength. He hinted that alterations in the Establishments might be necessary and he was proposing to co-ordinate with the Tank HQ in France on this matter.¹³⁸

The Tank Driving and Maintenance School used the extensive training areas to the north of the camp including practice trenches dug there by the Australians. The initial week-long courses were for experienced drivers who were to be retained at Wool as instructors. Following a suggestion from DSD that 75 of the first batch of 100 new tanks be allocated to the Training Centre¹³⁹, an increased number of tanks arrived at Wool in February 1917 and the driving course was lengthened to 16 days

TM E2006.1707. *Early Days at Bovington Camp*.

¹³⁸

TNA: WO32/11393: Army Organisations; Report on progress of formation of HB
MGC: Gore Anley progress report to DSD, 5 December 1916

¹³⁹

with 20 trainees arriving at Wool daily.¹⁴⁰ Training for the drivers was split between a Mechanical School where they worked on static and sectionalised engines and other components and the Tank Parks where running tanks were used for basic and advanced driver training over obstacles on the training area. All officers attended both the Mechanical School and the Tank Parks for basic familiarisation on the machines.¹⁴¹

The demand for trained reinforcements for France increased in June 1917 with the expansion of the Tank Corps, and the depot camp at Worget was used as an additional training centre producing another 20 drivers a day. As a result of combat experience from actions during Third Ypres, all crews were instructed in the use of the unditching beam. At its peak in late 1917, Wool provided four Tank Parks, each with 15 tanks dealing with 25 trainees arriving each day for a 12 day driving course lasting day and night. Night driving, an essential combat skill as most tanks had to move to assembly positions under cover of darkness, was carried out on two nights of each course. Drivers were also trained to carry out minor repairs on their vehicles when in action, major repairs being undertaken in the battalion workshops.

142

There was no tactical driving [i.e. manoeuvring the tank taking advantage of terrain and natural cover] and the main object was to get the tank over the most impossible places and when stuck to get going again with the aid of pick, shovel, crow bar and brute strength.¹⁴³

TNA: WO158/ 844-9: War Office Correspondence: GHQ: HS MGC: DSD to GHQ BEF, 7 December 1916

140

TM E2006.1707. *Early Days at Bovington Camp*

141

Lanning, 'Bovington Camp'

142

TM: E2006:1720: *History of Central Workshops Tank Corps.*

143

Tank obstacles on the training area were based on the latest intelligence on German defences and a section of the Hindenburg Line defences was recreated at Gallows Hill before the Battle of Cambrai. The replacement in the Mark V of the earlier cumbersome steering arrangements requiring four steersmen, with the Wilson constant-mesh epicyclic gearbox operated by the driver, required changes in crew training. However, such was the urgency to get all available Mk Vs to France that none was made available for training purposes at Wool; this was carried out hurriedly in France before they were committed to battle for the first time.¹⁴⁴

Gunnery training was split into two categories: training on the various machine guns used on all the tanks and on the heavier calibre guns carried on the male tanks. Initially training on both Vickers and Hotchkiss MGs was carried out on the training areas to the north of the camp. When all new tanks were fitted with the Lewis light MG in January 1917, training on these weapons was concentrated first at Lulworth, approximately 10 miles south of Wool, then at Wareham on a range at Holton Heath. All new gunners were taught the new belt-fed Hotchkiss from June 1917. MG practice from moving tanks was included. The use of a dismounted Lewis MG in support of neighbouring infantry in the event of a tank being abandoned was also practised – and much used during the 1918 German offensive.¹⁴⁵

The 6-Pounder Gunnery School moved to Wool in November 1916 where elementary drills and sub-calibre firing was carried out. Full calibre practice continued to be fired on the various naval and artillery ranges elsewhere until a gunnery range was established at Lulworth. Here firing was practiced from static

TM: E2007:3068:.. Brookes, Colonel G H, *Reminiscences of early training at Bovington*. The Royal Tank Regiment 50th Anniversary Souvenir 1917-1967 (1967) pp.30-32.
¹⁴⁴

Lanning, 'Bovington Camp'

¹⁴⁵

TM: E.2006:1717: 'History of the Tank Corps. Tank Gunnery School, England, 1916-1918.'. This is the (unpublished) source for the following three paragraphs

sponsons on the firing points and from moving tanks. In due course, sophisticated moving targets were introduced so that firing could be practiced from moving tanks against moving targets.¹⁴⁶

By early 1918, combat experience dictated that all gunners should be trained in the use of MGs and the 6 pounder. Therefore in February 1918, The Gunnery School at Wool was re-organized into a single school under a Chief Instructor with four branches. The Machine Gun Branch at Wool and Wareham (where a new range was constructed at East Holme) instructed on both Lewis and Hotchkiss MGs and included moving targets. The 6-Pounder Branch at Wool, Lulworth and Wareham included firing live shell from moving tanks. The Visual Training Branch practiced the visual acquisition of targets by all members of a tank crew. The Combined Battle Practice Branch was the final test of a gunner, carried out at Lulworth, and involved mobile live firing of all weapons at a variety of targets, both static and moving. Only when a gunner had satisfactorily passed this phase of his training was he allocated to a battalion for collective training.¹⁴⁷ Recent combat experience was used to the full in this gunnery training:

To do this all available information gained in action has been carefully examined, returned officers and other ranks from B.E.F. have been interviewed, and when possible School Instructors have been chosen from those who have fought Tanks in action.¹⁴⁸

146

Ibid

147

Ibid

148

Ibid

Training in reconnaissance resulted directly from combat experience.¹⁴⁹ The need for prior reconnaissance of routes for the tanks had been noted earlier. In July 1916, Swinton had emphasised the importance of the prior reconnaissance of the 'Position of Deployment',

The actual marking out of the routes for Tanks from the positions of deployment to their points on the starting line will be carried out by the Tank Skippers working under the Section Commanders.¹⁵⁰

In a similar vein, Lieutenant Colonel Brough emphasised that:

The selection of the precise route to be followed and the method by which the Tanks are moved to a position just behind our front line requires care and forethought, and time devoted to previous reconnaissance is essential.¹⁵¹

Clearly, at this stage, it was not envisaged that there needed to be a specific role for a specialised Reconnaissance Officer or for specialised training. However, in the light of combat experience, this view changed.

The post-action report produced by Kiggell made the point strongly:

In bringing up Tanks at night to their starting positions careful arrangements to enable them to find their way are necessary...very careful instructions to the Tank crews as to the route to be followed in the attack and the best way to find it are essential. Careful study beforehand of maps and photographs and sketches... marking clearly easily recognisable features by which they must pass... were found to be most useful.¹⁵²

When Elles created his Tank HQ in France in October 1916, he selected as his Intelligence Officer Captain F E Hotblack of the Intelligence Corps, who was already

¹⁴⁹

Colin Hardy, in his dissertation, 'Intelligence and Reconnaissance in the Tank Corps and its Predecessors on the Western Front 1916-1918' (MA, University of Birmingham, 2013) makes the distinction between intelligence and reconnaissance duties within the Tank Corps, largely one of nomenclature depending on rank and Staff grade.

¹⁵⁰

KCL Fuller Papers I/3/1. Swinton (with Brough and Bradley), *The Handling of the Heavy Section, Machine Gun Corps*. July 1916

¹⁵¹

¹⁵² TNA: WO158/236: Fourth Army Operations: Brough Memorandum. 11 June 1916

TNA: WO158/236: Fourth Army Operations: Kiggell to all Armies in BEF, 5 October 1916

serving on the staff of GHQ. Hotblack quickly became the reconnaissance expert at Tank HQ. He recognised the importance of ground reconnaissance prior to tank actions and was much involved in the training of ROs for the Tank Corps in France.¹⁵³

Meanwhile, in December 1916, GHQ made a request for an Intelligence Officer to be sent to Wool 'for a couple of months as an Instructor.' His duties were set out:

The officer selected will be required to instruct in map reading, the use of maps and in the interpretation of aeroplane photographs and should, if possible, be able to impart information on the general conditions of the country from a ground point of view.

The selected officer was to spend a fortnight working with Captain Hotblack at Tank HQ in France before moving to Wool.¹⁵⁴ Reconnaissance training was carried out both at Wool and in France. Initial training concentrated on the Intelligence Officers from the Intelligence Corps attached to each of the Tank Brigades formed in France from February 1917 onwards. Subsequently, Tank Corps battalion and company ROs were trained who in turn passed on the basic skills to the tank crews. Major Clough Williams Ellis, one of the pioneer Reconnaissance Officers, commented:

The necessity of regularising and systematising the Reconnaissance Branch had not been forgotten, and a separate Reconnaissance Service- really a specially adapted branch of 'Intelligence'- was set up under Major Hotblack...

¹⁵⁵

The course covered: topography; aerial photograph interpretation; panorama sketching; contour layering of maps; road, rail and river reconnaissance; terrain

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Hardy, 'Intelligence and Reconnaissance'

¹⁵⁴

TNA: WO158/844: War Office Correspondence: GHQ: Butler to BG (Int) at GHQ, 16 December 1916.

¹⁵⁵

Williams-Ellis, Major C & A, *The Tank Corps* (Country Life, 1919), p.41

modelling in plasticine; and elementary intelligence analysis. The course culminated in a 10 day practical exercise in which the students were given a variety of intelligence data and had to reconnoitre approach routes and 'jumping off' positions for an imaginary battalion of tanks. They also practiced the 'rushed' reconnaissance necessary for an emergency deployment of tanks. This latter training was included almost certainly as a direct result of the lessons learnt from the emergency tank actions against the German counter offensive at Gouzecourt in November 1917.¹⁵⁶

Training of tank company and section commanders in elementary reconnaissance was started in January 1918 at both Wool and Wareham together with a Draughtsman School. Thereafter NCO draughtsmen trained to produce route maps and field sketches were added to the establishment of the Battalion RO's sections. The importance attached to reconnaissance training was emphasised in a report produced in 1918:

The Battalion Reconnaissance Officer is the Reconnaissance expert, to whom everyone looks for assistance and advice, therefore the Reconnaissance Officer must know his subject, to enable Reconnaissance to be of use in the fighting forces. The Tank Corps has been fortunate in its Reconnaissance Officers, and in battle they have been well forward, and of great assistance to the Tanks, owing to their special knowledge of the ground.¹⁵⁷

A number of other smaller instructional schools were established at Wool. The Signalling School, set up on 4 January 1917, trained signallers to communicate between tanks and from tanks to rear headquarters, and to communicate between battalion and companies and higher formations. Training in Morse Code, telephone

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¹⁵⁷ Williams-Ellis, *Tank Corps*, p.42

¹⁵⁷

TNA: WO158/802: War Office Correspondence: GHQ: Tank Corps: Training Schools and TM E2006.1716 *Tank Corps History*. Much of the information regarding the training carried out at Bovington (Wool), Wareham (Worgret), Lulworth and Swanage is to be found in an (unpublished) document titled 'Central Schools.' It is undated but appears to have been written in mid-1918.

and lamps was carried out initially by instructors from the Signal Service of the Royal Engineers but was restricted by the lack of suitable equipment. Trained officers and men then returned to their battalions to train others. In time it was decided that communications other than between tanks would be the responsibility of a RE Signal Company attached to each battalion. A number of methods were experimented with. Morse was abandoned as impractical and a system of semaphore introduced. Communication between tanks and accompanying infantry remained a problem that was never fully resolved.¹⁵⁸ Carrier Pigeons were also used as a mean of carrying messages and a Pigeon School was opened at Wool on the 14 February 1917.¹⁵⁹

A Revolver School was set up at Wool in December 1916 when it was realised as a result of battle experience on the Somme that a revolver was the most practical personal weapon for the tank crews:

From active service experience it has been found that the revolver, properly understood and handled, can be a most useful and deadly weapon in the field. Its simplicity and reliability rendered it extremely good for use in the Tank.

All the potential tank crews in the battalions being formed at Wool classified in revolver practice on static and moving targets.¹⁶⁰

A Compass School was established on 4 January 1917, when it was recognised that, because of limited visibility, tanks sometimes needed to be steered by compass. Initially, before the effect of deviation caused by the steel mass of the tank were fully realised, the issue compasses were thought to be unreliable and

¹⁵⁸

TM: E2006.1716, p.4

¹⁵⁹

Ibid, p.4

¹⁶⁰

Ibid, p.7-8

useless. Once all tank crews had received instruction in the correct use of the compass, confidence was restored. Training, initially carried out by Royal Navy instructors, was at first restricted to the officer section commanders but was later extended to all members of the tank crew.¹⁶¹

A Camouflage School was established as late as January 1918 at Bovington and later at Wareham. Prior to this, attempts at camouflaging machines had been rudimentary. Camouflage nets issued before Third Ypres had not arrived in time to be trained on before the battle started:

The original purpose and design of nets has been disregarded, very few of the officers had, of course, had the opportunity of learning what it was. The result was a risky haphazard effort. Many nets were put on upside down or wrong way across; thereby losing a great deal of their screening power.¹⁶²

Gas Schools were established at Wool on 24 April 1917 and at Wareham in September 1917 to train in the fitting of masks, and driving and handling the armaments whilst under gas attack.¹⁶³

In February 1917, it was decided that all ranks of the Tank Corps should be trained in the use of grenades and a Bombing School was established. Instructors were selected among men who had previous battle experience of bombing. As well as training Instructors, all ranks from the battalions currently forming at Bovington passed through the three day course which included dummy and live throwing, as well as trench fighting and bombing raids. Interestingly, they were also trained how to throw captured German grenades. The use of phosphorous grenades for clearing strong points was also practiced.¹⁶⁴

¹⁶¹

Ibid, p.9

¹⁶²

Captain Paget RE., quoted in 'Central Schools' p. 11

¹⁶³

Ibid p.13

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At the end of 1916, Gore Anley issued a comprehensive, 15 page Training Memorandum with six appendices. It covered general principles, policy and responsibilities regarding training. It is clear that Gore Anley placed great emphasis on a high standard of discipline at the Centre (possibly the reason why he had been selected for the post), on physical efficiency achieved through games and sports played by all ranks, and 'Esprit de Corps- the fighting spirit...These are the first essentials in the Heavy Branch. They must be followed by expert technical knowledge and a sound conception of the tactics and movements of the Infantry, the arm with which the Heavy Branch will have to co-operate mostly.' The Memorandum explained the difficulty of training individuals and crews who had joined the Heavy Branch with a variety of previous experience, or in some cases as raw recruits, so that they could proceed to France for further collective training as formed crews within a battalion. Nonetheless detailed appendices and schedules laid down deadlines for various phases of training to be completed in order for the new battalions to proceed to France.¹⁶⁵

The Training Centre at Bovington, Wareham, Lulworth and Swanage trained a remarkable number of men of all ranks in the relatively short period of its existence from December 1916 to December 1918.¹⁶⁶ Great emphasis was placed on ensuring the training reflected lessons learnt so far during the war. The new battalions were formed around the nucleus of a company which had already had experience in battle. Instructors were largely drawn from men with recent combat experience. Close liaison was maintained with the training organisation in France. From March

Ibid p.14

¹⁶⁵

TM: E1949.135.3.3: *Training Memorandum No.2: Memorandum on the training of Battalions generally*. 29 December 1916.

¹⁶⁶

TM: E2006.1720: *Tank School Bovington & Wareham*.

1917, 15 officers and 15 OR instructional staff from the Training Centre in UK exchanged with a similar number of instructional staff from France for periods of 3 months. Some were then permanently retained in the UK.¹⁶⁷

Little of the actual work of training could start till the end of November [1916], when the 'veteran' Tank personnel were at last available as instructors...

They were the leaven - less than one 'old' Company to each new Battalion-who must impart their knowledge and experience to the new men.

A Subaltern who had seen any fighting with the Tanks would suddenly find himself regarded as the greatest living expert on some obscure technical point, and the newly joined who had never seen a Tank 'looked with awe on these battle-tried warriors'.¹⁶⁸

In a lecture delivered by Lieutenant B L Q Henriques, a battle experienced tank commander from G Battalion, to a group of aspiring Tank Corps battalion, company and section commanders at Bovington in March 1917, he graphically described the deficiencies in the training of the crews who went into action in September 1916.¹⁶⁹ By early 1917, it is clear that lessons had been learnt and the deficiencies were being tackled energetically by Gore Anley and his replacement as commander at Bovington, Brigadier-General W Glasgow.

In the brief lull in fighting between the end of November 1916 and the start of the Arras offensive in April 1917, the priority was to raise the five battalions in the UK and expand the four existing companies in France. Instruction was based on the very limited combat experience gained on the Somme in 1916. The dual nature of early training, with five entirely new battalions being formed at Bovington and the existing companies in France being expanded form a further four battalions,

¹⁶⁷

'Central Schools', p.2

¹⁶⁸

Williams Ellis, *Tank Corps*, p.39

¹⁶⁹

TM E2007.551: Henriques, B.L.Q., *Lecture on the attack on the Quadrilateral, Bovington Camp, 6 March 1917*

complicated the training arrangements for the Branch as a whole with, inevitably, some duplication in effort both sides of the Channel.

Initially, training in the UK was largely concerned with forming a cadre of trained, battle experienced Instructors, then with the individual training of crew members and, in addition, the basic military training of the new battalions. Training in France concentrated more on the collective training of formed tank crews and on tactical training.

TANK TRAINING IN FRANCE

After the Somme fighting came to a halt, the tank companies withdrew and concentrated in an area north west of St Pol. A depot and workshop facility was established at Erin and individual battalion 'tankodromes' at Blangy, Bermicourt, Erin and Pierremont. Tank HQ was set up in the chateau at Bermicourt. This concentrated area was chosen for training 'to reduce the amount of damage likely to accrue from the use of tanks in the district.'¹⁷⁰

Initially, training in France was greatly hampered by the lack of available tanks and spares with only 16 working tanks available for the training of the 4 embryonic battalions: 'for the purposes of collective training and tactical exercises recourse was therefore had to dummy tanks, i.e. canvas structures carried by men equal in number to a tank crew.' By all accounts, this improvisation caused much hilarity and not a few injuries among the crews involved.¹⁷¹

¹⁷⁰

TNA: WO158/803: War Office Correspondence: GHQ: Tank Corps: Infantry and Tank Co-operation. p.1

¹⁷¹

Ibid p.1

Preliminary training in the Erin/Bermicourt area consisted of nine day courses in driving using four tanks per battalion. Lewis gun practice was carried out on ranges set up by the individual battalions in their localities. 6-pounder gun courses of 3 days were carried out at Pierremont. At this stage much of the training was improvised and localised:

Training schemes were at this time necessarily intuitive and the system adopted was to issue Memoranda, setting forth the principles of training and supplementing them from time to time with Training Notes to be amended, withdrawn and substituted as the occasion arose.¹⁷²

The formalisation and centralisation of training did not finally take place until the issue of the pamphlet *Instructions for the Training of the Tank Corps in France* in December 1917¹⁷³. Training at the various battalion locations was supplemented by parties of officers and NCOs being sent to the infantry Lewis gun course at Le Touquet and to the various Infantry Schools of Instruction. Some aspects of training became more centralised with a Central Tank Driving School and a Central Mechanical School being set up near the Tank Corps HQ at Bermicourt in January 1917.¹⁷⁴

The cold and wet winter of 1916-1917, meant that indoor 'schemes' had to be practised among the battalion officers, the closest they could get at this stage to practical tactical training:

Indoor schemes were carried out at intervals during the winter months. Schemes were issued in phases. Battalion commanders then assembled

¹⁷²

Ibid p.2

¹⁷³

TM: E2007.3021: GS 943. *Instructions for the Training of the Tank Corps in France*. 1 December 1917.

¹⁷⁴

TNA: WO158/803: War Office Correspondence: GHQ: Tank Corps: Infantry and Tank Co-operation
p.2

their Company Commanders, the scheme was discussed and a solution arrived at. Those solutions were subsequently discussed at a meeting of Battalion Commanders which was summonsed once a week for the purpose. The common decision come to at these conferences was then circulated as the final solution among Company Commanders.¹⁷⁵

The development of *esprit de corps* in the newly created organisation formed by the drawing together of men from diverse backgrounds was high priority and much emphasis was given in France as well as in the UK to physical fitness, competitive games, drill and discipline.

The 6-pounder range near Bermicourt proved to be impractical in terms of safety and limited range and in April 1917 a tank gunnery school was established in the sand dunes on the coast at Merlimont. Here there were 'exceptional opportunities' for firing out to sea and the use of the extensive sand dunes and the beach for moving target practice. Three 6-pounder guns in sponsons were used for shooting practice lasting two days. Practice on the Lewis gun and revolver was added to the instruction carried out there. Initially, there was no official establishment for the gunnery facilities at Merlimont which were administered by one of the Tank Brigades formed in France. Complete companies from the battalions in France carried out the training collectively at Merlimont.¹⁷⁶

In June 1917, following the Arras offensive, gunnery training took place at Merlimont; driving, mechanical and maintenance training now took place on the recently captured German trenches near Wailly; anti-gas and compass work at Erin and wireless signalling at Fleury.¹⁷⁷ The establishment for the Gunnery School at Merlimont was finally approved in September 1917 with the appointment of a

¹⁷⁵

Ibid p.3. See Chapter 3 for a description of the 'Indoor Scheme'.

¹⁷⁶

Ibid.p.3

¹⁷⁷

Ibid.p.3

Commandant, Adjutant, Equipment Officer and Chief Instructors for the various schools.¹⁷⁸

A distinction was made between Schools and Camps. Schools were on a permanent basis with an approved establishment. They were mainly concerned with training instructors and reinforcements from the UK. Camps were set up temporarily by Brigades as the need arose to train their sub-units. Collective training was also carried out and at Merlimont accommodation and facilities were provided for four companies at a time, in addition to those receiving instruction at the School.¹⁷⁹

In time, the improvised nature of the training, instructional staff and facilities at Merlimont were regularised, establishments were approved and sophisticated Battle Practice ranges using live ammunition were constructed. In March 1918, following the use in action of tank crews as dismounted Lewis gun teams during the German offensive, extensive training in 'open warfare' was accelerated. 'Extra Instructors sent from Battalions to meet this emergency. Great lack of knowledge as to the tactical handling in the open was noted.'¹⁸⁰

An area at Wailly, south west of Arras, of former German trenches and dug-outs was taken over following the Arras offensive in April 1917. The driving facilities there were described as an area 'exceptionally adapted both in extent and character for training... This area contained every feature requisite for practice, it reproduced the conditions to be met with on the actual battlefields and gave opportunity for driving over shell holes, dug outs and trenches of varying width and depth.' The

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¹⁷⁹ Ibid.p.4

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¹⁸⁰ Ibid.p.4

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TNA: WO158/802: War Office Correspondence: GHQ: Tank Corps: Training Schools. 1 February 1919

Establishment for the Mechanical Maintenance and Driving School at Wailly was finally approved in September 1917.¹⁸¹

In July 1917, an area suitable for tank practice was selected near Le Treport on the Channel coast.

In probably a greater number of particulars than any area that could be found, it fulfilled the conditions requisite for Tank manoeuvre. Standing on high cliffs above the shore, it had an unrestricted field of fire in the direction of the sea. On the landside it formed an extensive stretch of downs, broken here and there by sharp depressions and generally having sufficient irregularities to provide variation in the character of the ground to be traversed. Here one Brigade at a time was accommodated from November onwards and...Special Battle Practice Courses were held for officers and other ranks. The general idea was to make the gunner put into practice the lessons learnt...in the 6 Pdr, and Hotchkiss Machine guns, the Revolver and Visual Training.¹⁸²

Similarly, Special Driving Camps of Instruction were established at Wailly and two near Bray-sur-Somme, one for each of the three Tank Brigades, where a company from each of the three battalions could exercise at the same time. Training tanks remained at the special camps throughout the winter period allowing opportunities for training whenever operational commitments allowed.¹⁸³

Training in reconnaissance continued in France following initial training at Wool. Hotblack was appointed GSO2 (Intelligence) at Tank Corps HQ and organised 12 day courses there. The object was to produce specialised Battalion ROs who would, in turn, run courses in reconnaissance duties at company and

¹⁸¹

TNA: WO158/803: War Office Correspondence: GHQ: Tank Corps: Infantry and Tank Co-operation
p.8, September 1917

¹⁸²

Ibid.p.10

¹⁸³

Ibid.p.10

section level in their own battalions. In time, the ROs would become something of an essential '*corps d'elite*' within the Tank Corps.¹⁸⁴

Cooperative training with the other arms was not neglected. One company of tanks was attached to each Army and worked in the Army, Corps or Divisional Training Areas, as required. Tank Corps officers who had not served with infantry in the trenches or not yet been into action with the tanks were attached for periods of 14 days to an infantry battalion in the line. Similarly, junior infantry and artillery officers were attached to tank battalions for periods of seven days.¹⁸⁵

CONCLUSIONS

By the end of 1916, the various elements of the HBMGC had reason to be cautiously optimistic. Despite Elles' misgivings about the split in responsibility between his operational HQ in France and the administrative HQ in England, a workable system for training tank crews had evolved; individual training at Wool and collective and tactical training in France. However, training both sides of the Channel was hampered by lack of machines.

The theoretical tank tactical doctrine formulated largely by Swinton had been put to the test in the operations on the Somme. The optimistic expectations of this novel weapon of war had been tempered by the realities of combat; the mechanical limitations of the tank, the lack of sufficient numbers and the inadequate training of

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Hardy, Colin. *Reconographers: Intelligence and Reconnaissance In British Tank Operations on the Western Front, 1916-1918*. (Solihull: Helion, forthcoming, 2017), Ch. 9. (I am indebted to Colin Hardy for permission to consult and discuss his work on reconnaissance prior to publication.)

¹⁸⁵

TNA: WO158/803: War Office Correspondence: GHQ: Tank Corps: Infantry and Tank Co-operation
p.11

the crews. Tactical doctrine had evolved 'on the job', and in the light of combat experience. Nonetheless, the tank had shown its potential and GHQ had given the go-ahead for the expansion of the corps.

What was lacking was evaluation of the future potential of the tank and the formulation of operational doctrine. The brief lull in operations between the closing of operations on the Somme in November 1916 and the start of the Arras offensive in April 1917 provided the opportunity for such to take place. The arrival of Major J F C Fuller as the GSO2 (later GSO1) at HQ Tanks in France in late 1916 provided the catalyst.

The following chapter will discuss the role and influence of Fuller and others in the development of tactical and operational tank doctrine and the training of the Tank Corps.

CHAPTER THREE: THE THEORY - THE EVOLUTION OF TACTICAL AND OPERATIONAL DOCTRINE

This chapter will concentrate on the development of tactical and operational doctrine, and the consequential developments in training requirements following the combat experience gained on the Somme, limited though that experience was. The chapter will examine the following research questions: how did tank operational doctrine evolve? How was it derived and by whom? How was it implemented? How did it fit in with overall BEF operational doctrine? What training requirements evolved at each stage of the developing doctrine? The chapter will look at, in turn, the contributions of various personalities; it will examine the influence of the 'Mechanical Warfare' debate; and assess the involvement of GHQ in the production of tactical and operational doctrine.

THE INFLUENCE OF FULLER

Elles recommended the addition to his existing general staff at Tank HQ, (then consisting of himself, a Brigade Major and the Intelligence Officer), of a staff- trained GSO1 whose function would be to co-ordinate and direct the collective training of the battalions in France:

(d) A senior General Staff Officer will be necessary next year on full expansion, but it is suggested that the most important part of his work is before the expansion has actually begun.¹⁸⁶

Haig agreed to Elles' suggestions and made his own recommendation to the WO on 13 December 1916 for the addition of a GSO to Tank HQ.¹⁸⁷

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TNA: WO158/844-11: War Office Correspondence: GHQ: HS MGC: Elles to DCGS, GHQ, 3 December 1916.

¹⁸⁷

The man appointed to this post in December 1916 was Major J.F.C. Fuller of the Oxfordshire and Buckinghamshire Light Infantry. It was a fortunate and significant appointment. Fuller's reputation and legacy has been tainted somewhat by his dalliance with the occult, metaphysics, spiritualism and, later, with fascism. He also had a reputation as an unorthodox, innovative and thoughtful, if somewhat arrogant, staff officer and trainer, a thinker prepared to challenge conventional wisdom. The newly-formed corps was the ideal seed-bed for his fertile mind. There is little doubt that his impact on the training and professionalism of the Tank Corps and the formulation of tank tactical and operational doctrine during the Great War was profound.

Fuller's two biographers, Trythall writing in 1977 and Holden Reid writing in 1987, generally hold a constructive view of Fuller's contribution.¹⁸⁸ Other historians are more sceptical. Harris considered the 'reams and reams' of papers and instructions that Fuller produced 'were of little use as guides to action.'¹⁸⁹ This judgement is harsh. Fuller's initial contribution was the first serious attempt to produce a guide to tank tactical doctrine and it remained the only practical guide for nearly a year.

A picture of him at Tank HQ is provided by Captain Evan Charteris, a GSO3 at Tank HQ:

Here I... first made acquaintance with Evans [Charteris' pseudonym for Fuller], the GSO1 of the Tank Corps – GSO1 and brain... He stood out at once as a totally unconventional soldier, prolific in ideas, fluent in expression, at daggers drawn with received opinion, authority, and tradition... He was an inexhaustible writer, and from his office issued reams on reams about

TNA: WO158/844-14: War Office Correspondence: GHQ: Tank Corps: Haig to War Office, 13 December 1916.

¹⁸⁸

Trythall, Anthony, *Boney Fuller: The Intellectual General* (Cassell, 1977); Holden Reid, Brian, *J.F.C. Fuller: Military Thinker* (Macmillan, 1990 [1987])

¹⁸⁹

Harris J.P., *Men, Ideas and Tanks* p.83

training, plans of campaign, organisation and schemes for the use of tanks. He was an invaluable element both from a military and social point of view, but his brains would have been better utilised at GHQ galvanising that conservative centre with advanced ideas... He was neither an administrator, nor probably a good commander, but just what a staff officer ought to be, evolving sound ideas and leaving the execution to others.¹⁹⁰

Another, somewhat effusive, description of Fuller's contribution is provided by Major Stephen Foot, who served as BM to 2 Brigade, Tank Corps:

For their success Tanks require tactics no less than petrol; Fuller devised them. Before an attack can be launched there must be a plan; Fuller made it. After an attack, lessons must be learnt both from success and failure; Fuller absorbed them. And, sad to relate, in the case of the Tanks a constant war had to be waged against the apathy, incredulity and short-sightedness of GHQ; Fuller fought that war, and won.¹⁹¹

Foot, an ardent supporter of Fuller, somewhat slavishly followed Fuller's hostile view of Haig and GHQ and arguably over-emphasised Fuller's role in changing GHQ's perceived negative view of the tank, a view that cannot be supported by the evidence.

On his appointment on 26 December 1916, Elles told Fuller: 'This show badly needs pulling together; it is all so new that one hardly knows which way to turn. I want you to do this: to put some discipline, some *esprit de corps*, into the men; then we shall have a good show.'¹⁹² Characteristically, Fuller launched himself enthusiastically into his new role. Fuller believed there were three main problems to be solved. 'The first was to moralise [sic] the men; the second was to instruct the officers and the third was to assist in organising the whole, so that maximum tactical power might be developed.'¹⁹³ By 10 January 1917, less than two weeks after he

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TM: B1985.213 (CHA): Charteris, Captain Evan, *HQ Tanks 1917-1918*. (Privately published, 1920)

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¹⁹² Foot, *Three Lives* p.203

¹⁹³ Elles, quoted by Fuller, *Memoirs*, p.87

Fuller, *Memoirs*, p.87

arrived at Bermicourt, Fuller had produced a comprehensive 'indoor scheme' for the tank battalion commanders in France. It was a remarkable achievement bearing in mind that Fuller came to Tank HQ with no previous knowledge of the capabilities and limitations of tanks.

He devised an imaginary 'scheme' based on a Fifth Army attack supported by tanks in the area between Puisieux and Beaucourt north of the Ancre. The 'scheme' was conducted in three phases. Having been presented with trench maps, extracts from divisional plans, artillery plans, intelligence summaries, movement orders, loading plans and other relevant information, the tank battalion and company commanders were invited to find solutions to various problems set by Fuller. The commanders would then present the 'battalion solution' at a conference of battalion commanders the following week before being given the next phase of the 'scheme'.

For each of the three phases, Fuller produced his own solutions to the various problems. In Fuller's comprehensive and voluminous solutions, amounting in all to 24 foolscap pages of typed notes, we can glimpse signs of formal operational doctrine emerging. Most of his solutions concerned administrative and logistical matters but some strayed into doctrinal matters. For instance, in describing his solution to the overall tank operation, Fuller recommended:

He [the Tank Battalion Commander] would insist on one thing: that the success of the Tank Operations would depend on deciding on a definite policy of action which would not be upset by the personal wishes of the Divisional Commanders.

...Tank operations would therefore have to be divided under two headings (i) Tanks allotted for co-operation in the taking of the Main Objective (ii) Tanks allotted for emergency work and definite strongpoints operations within the main objective. Generally, (i) would be under Corps control and (ii) under Divisional.¹⁹⁴

Drawing on the tanks' previous experience of combat, Fuller emphasised:

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KCL Fuller papers. I/4/11. Fuller, 'Indoor Scheme no.1'. p.12.

... it must be remembered that past experience has shown that though the infantry assault frequently succeeds in capturing the enemy's 1st line system it is usually completely held up by his 2nd line of defence, ...The first step in gaining the main objective will therefore be the enemy's 2nd line which should be attacked by Tanks.¹⁹⁵

However, some previous combat experience was apparently ignored. Despite the previous criticism of Rawlinson's use of 'artillery-free' lanes in September, Fuller recommended that the Tank Battalion commander 'might suggest to the GOC, RA, that it would help the advance of the Tanks through the enemy's lines if lanes free from shell fire from Heavy Artillery were left at certain places within the area of bombardment.'¹⁹⁶ It is conceivable that Fuller was not aware of the widespread criticism of this policy during the Somme offensive, as he was not involved with tanks at the time, but it is surprising that this comment found its way into his paper.

Fuller's own assessment of the value of the exercise was as follows:

A comprehensive piece of work, each officer taking part in it giving something of value towards the common solutions. I say the results were extraordinary because during the many battles which faced us very few new problems arose; consequently the exercise was a real intellectual foundation for our training.¹⁹⁷

Although, understandably, Fuller was enthusiastic about the success of his exercise, one cannot help wonder what the initial reactions of the battle-experienced battalion officers were to the opinions of a relatively junior staff officer (Fuller was not promoted to Lieutenant Colonel as GSO1 at Tank HQ until April 1917)¹⁹⁸ from an

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¹⁹⁶ Fuller, 'Indoor Scheme' p.18

¹⁹⁷ Fuller, 'Indoor Scheme' p.2

¹⁹⁸ Fuller, *Memoirs*, p.92

Liddell Hart, *Tanks* (1), p.91

infantry background, with limited combat experience and no previous experience at all of tanks. Fuller was not known for his tact in expressing his opinions.¹⁹⁹

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TM: E1980.18: His hand-written journal in Tank Museum archives is replete with caustic comments on the abilities, or otherwise, of senior commanders. For example, he refers to Kiggell as 'Ethelred the unready', General Estienne as an 'ignorant and amusing little dud' who 'knows nothing of the science of war', Brigadier-General Sackville-West at Supreme Headquarters, Versailles as 'a nonentity.'

TRAINING NOTE NO.16

At the conclusion of the indoor exercises, Fuller collated his solutions, and presumably those of the battalion and company commanders, as the lessons learnt, into an important doctrinal document, 'Training Note No. 16: Tank Tactics.'²⁰⁰ Fuller claimed this to be 'the first training manual of its kind, for what had thus far been issued were nothing more than a few platitudinous notes' and that it 'formed, for over a year, the foundation of tank tactics.'²⁰¹ This comment appears to be somewhat dismissive of the work done previously by Swinton but Fuller later claimed not to have been aware of Swinton's 'Notes on the Employment of Tanks' written a year previously, until February 1918.²⁰² Given Fuller's previous non-involvement with tanks, this is entirely plausible and it is all the more remarkable how closely Fuller's and Swinton's views coincide.

'Training Note 16' is a 24 page document with five appendices and seven diagrams. The cover carries a warning:

The following tactical notes, until further experience is gained, must be considered as provisional...These notes will be amended from time to time and reissued.²⁰³

Although described by Fuller as 'tactical notes', they are in effect a combination of both operational and tactical doctrine. The first part of the document has chapters on tank organisation, tank operations, tank tactics and tank co-operation with other

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201 KCL Fuller papers. I/6/1. Fuller, *Training Note 16. Tank Tactics*

202 Fuller, *Memoirs*, p.96

203 Fuller, *Memoirs*, p.169

KCL Fuller papers I/6/1. Fuller. 'Training Note' Cover page.

arms and deals with the role of the tank in the corps and divisional battle and would thus be considered operational doctrine.²⁰⁴ The latter part of the Note has chapters on preparations for the offensive, system of supply, system of communication, reinforcements and methods of camouflage. Much of this material is thus more in the nature of tactical doctrine. A noticeable omission is any mention of the use of tanks in defence, an omission that had to be rectified rapidly a year later during the German offensive in March 1918.

Fuller defined the tank as a 'mobile fortress' immune from shrapnel, shell splinters or bullets. It could deliver a high volume of fire from its Lewis machine guns and the 6 pounder gun and was capable of moving 'practically over any ground and through all entanglements.' It was best fought on the offensive principle and was 'best suited to give blows at close quarters without receiving them.'²⁰⁵

With the benefit of hindsight we know that some of these attributes were optimistic. The tank, at least in its early versions, was not entirely immune from small arms fire and certainly not from direct shell fire. It was very vulnerable to adverse ground conditions and was only really successful on undamaged ground that had been partially chosen with tank operations in mind. Fuller makes no mention of their mechanical frailty, their lack of speed nor of their cumbersome ability to manoeuvre.

Fuller identified that the weakness in current tactics on the Western Front was what he described as a 'great extension of front with little depth of reserves.' In other words, attacks on a broad front failed because enemy obstacles covered by flanking fire exhausted the attackers before reserves could be deployed. Penetration

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See definitions of operational and tactical doctrine, page 17

²⁰⁵

Fuller, 'Training Note 16'. p.2

was thus never achieved. He believed that the 'main Tank objectives are those lines of trenches and wire which will offer the greatest resistance to the infantry advance; namely, the enemy's second and subsequence lines of defence.'²⁰⁶

To achieve surprise, 'essential to success in a trench attack', Fuller recommended that both the infantry attack and the artillery bombardment be 'exceedingly rapid' to prevent the enemy realising that an attack was about to take place and to stop him drawing in reserves from his flanks. The ideal operation to take all three defence lines would last 12 to 16 hours following an artillery bombardment of not exceeding 48 hours. If the artillery was unable to carry out all the necessary preparatory work on the enemy defences in this time, the tanks would be able to do so. In so doing, Fuller seemed to be equating the capabilities and characteristics of the relatively unsophisticated and short-range 6-pounder with the more technically sophisticated, more powerful and longer-range guns available to the Royal Artillery. This point illustrates Fuller's lack of a broader experience of other Arms and his somewhat myopic view that tanks could readily take over the functions of, for instance, the artillery or the cavalry.

Fuller envisaged a line of sections of tanks advancing through the attacking infantry onto the second line of defences to keep the enemy in a state of disorganisation pending the arrival of re-organised or fresh troops. Thereafter, the advance on the third line of defences 'will savour more of a pursuit than an assault' with the tanks preventing the enemy consolidating in rear.²⁰⁷ Fuller summarised the object of the tank in the attack as:

(1) To open the way for the infantry.

²⁰⁶

Ibid. p.3

²⁰⁷

Ibid. p.4

- (2) To accentuate the disorganization of the enemy.
- (3) To cover our own reorganization.
- (4) To prevent the enemy throwing up new defences²⁰⁸

Fuller was realistic enough to accept that 'as long as the Tanks are limited in number, it must be remembered that the majority of them will have to be used against the enemy's second line system for this is the first great obstacle the attacking infantry will have to surmount once the first line is captured.' He did emphasise, however, that each defensive system would require a separate echelon of tanks. In dealing with isolated strong points, Fuller thought it would be necessary to detail certain tank units as 'moppers up'. A section or half section of tanks 'will in a short period of time accomplish what many heavy guns and a large force of infantry would take several hours to carry out.'²⁰⁹

Fuller considered the distribution of tanks to formations. Those tanks which were allocated to deal with the main objectives would be distributed to the Corps, the formations which controlled the artillery; those allocated as 'moppers up' or to attack strong points or other unexpected situations would be distributed to Divisions as they controlled the attacking troops. Co-operation between the tanks and the infantry and artillery was vital to the success of the tank operation.

Dealing with tank tactics, Fuller emphasised that the enemy's most vulnerable points were the flanks exposed during a penetration. He therefore recommended that columns of tanks should be specifically tasked with dealing with enemy defence lines exposed by the initial penetration. Fuller did concede that the creeping barrage would usually be more effective than tanks and 'the Tank is in no

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Ibid. p.5

²⁰⁹

Ibid. p.5

way intended to replace the Barrage but to supplement it when it breaks down or become ineffective.^{'210}

In implementing these tactics, Fuller arrived at what he termed 'The Triple Formation' – 'a formation of echelons of [tank] section columns in three... bodies – the main body and two wings.' Each echelon would have definite objectives and would be followed by 'a local reserve to meet the unexpected and to "mop-up" points of resistance.' The section of four tanks was chosen as the unit of attack 'on account of its flexibility and the power it possesses of being able to split itself into two half-sections of two tanks, the smallest number that should ever operate together with the present type of Tank.'²¹¹

Fuller had listed co-operation with other arms as one of his 'principles'. With regard to artillery co-operation, Fuller acknowledged that tanks were vulnerable to artillery fire. Therefore, counter-battery fire afforded the best protection from the artillery. It was also important to co-ordinate the movement of the tanks with the friendly barrage to avoid casualties and to be able to communicate rapidly the position of tanks to the supporting gunners. This latter requirement was never satisfactorily resolved throughout the war.²¹² On infantry co-operation, Fuller emphasised that:

unless the closest bond of sympathy unite these two arms, the infantry will not be able to take advantage of the opportunities which the tanks create... The Infantry Commander must remember that the duty of the tank is to open the way for the infantry and not to pull the infantry's chestnuts out of the fire... Further the Infantry must remember that, except in 'mopping-up' operations, they MUST NOT WAIT FOR THE TANKS [Fuller's emphasis], for

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Ibid. p.9

211

Ibid. p.9

212

Ibid p.11

the object of the Tank is to accelerate the infantry advance and in no way impede it by delays which may be due to mechanical trouble.²¹³

Here was tacit acknowledgement of one of the great weaknesses of the early marks of tank – their inherent mechanical unreliability.

With cavalry co-operation, Fuller suggested that tanks could act as a moving line of 'blockhouses' from which the cavalry could advance or behind which they could retire. He saw them being used to form a bridgehead or to seize and hold points of tactical importance in advance of the infantry. In this respect, Fuller's expectations of the tanks in this role were somewhat fanciful. The mismatch in speed and endurance between tanks and cavalry was considerable at this stage of their development.²¹⁴ It is interesting that at this stage of the development of Fuller's doctrinal philosophy, he was advocating co-operation with cavalry. This contrasts with his later views. In April 1918, for instance, he produced a short paper, prompted by the development of what he then termed, 'a light tank' – the Medium A Whippet, on the pros and cons of the cavalry against tank forces.²¹⁵

Among the Appendices was a 'Battle History' report form to be completed, post operation, by the tank commander. It included such detail as the Unit to which the tank was attached, the hour at which the tank started for action, time of zero hour, extent and nature of hostile shell fire, ammunition expended, casualties, position and condition of tank after action, orders that were received and a report on the action. The Battle History Report form represented the first attempt to formalise the post action report process. Surviving examples vary greatly in their quality and

²¹³

Ibid.p.12

²¹⁴

Ibid.p.13

²¹⁵

TM: E1980.18: Fuller 'Journal', Appx. B32. Undated but likely to be April 1918 from its location in the Journal

quantity of information, no doubt reflecting the post-action state of the commander, or, in some cases, of his NCO replacement.²¹⁶ They were most probably useful in analysing, for instance, common mechanical failures, ammunition and fuel expenditure and the like but, as they reflected the rather limited visual and actual combat experience of junior commanders, they may not have influenced to any degree the development of subsequent tactical doctrine.

In summary, 'Training Note 16' was a significant and largely practical document. Its content, although reflecting Fuller's vision of the use of the tank to break the deadlock on Western Front, also contained the distillation of the combat experience gained so far by the battalion and company commanders and garnered through the indoor exercise discussions. It was, however, still only based on the limited use of the tank so far in combat in rather less than ideal conditions. It could be criticised for being somewhat verbose and overly optimistic about the capabilities of the tank in its current form but Fuller himself pointed out in the introduction that it was provisional and subject to revision in the light of further experience.²¹⁷

Unfortunately, it did not achieve widespread circulation because GHQ ordered the withdrawal of all the copies that had already been widely distributed, apparently on the grounds that the 48 hour preliminary bombardment recommended by Fuller was not approved by the artillery hierarchy.²¹⁸ Fuller did, however, circulate copies within the Heavy Branch and the Note became the only attempt to impose

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²¹⁸ Fuller, 'Training Note 16', Introductory Note on cover page.

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Fuller, *Memoirs*, p.98

some element of coordinated operational and tactical doctrine on the Corps for almost a year.²¹⁹

In his time at Tank Corps HQ, Fuller produced numerous papers which generally fell into two categories; instructions on tactical and training matters resulting from lessons learnt during the tank actions of 1917 and 1918 and his more philosophical papers on operational doctrine which contributed to the Mechanical Warfare debate.

THE MECHANICAL WARFARE DEBATE

In June 1917, whilst the lessons of Arras (see next chapter) were being absorbed and when planning for the next use of tanks at Messines was already underway, Fuller turned his visionary mind to a general theory on the use of tanks in the future. This was, he said, to allow any proposals to filter through the system and be co-ordinated with the plans of other arms, to allow time for co-operative training with other arms and, most importantly, to carefully select a suitable area for tank operations.²²⁰

Fuller's 'Projected Bases for Tactical Employment of Tanks in 1918', (later called simply, 'The Tactical Employment of Tanks in 1918'), was drafted on 10 and 11 June 1917. It was a combination of, in his own words, 'grand strategic thinking and minor tactics' and was written; 'mainly for my own instruction, subsequently it led to the instruction of others and to little dreamed-of conclusions at the time.'²²¹.

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²²⁰ Liddell Hart, *Tanks*, (1), p.92

²²¹ Fuller, *Memoirs*, p.123

Increasingly, Fuller was promoting the concept of a 'Mechanical Army' with the tank playing the leading role in future combat.

Today onwards... one thing is certain, and that is that mechanical force is going to supplant muscular force as regards movement, movement not only behind the battle front as now, but in the very van of the battle itself. The following is a suggestion towards the solution of this problem. The creation of a Mechanical Striking Force...

Mechanical warfare is going to supercede [sic] muscular warfare... more and more is war[fare] going to depend on the engine rather than man's legs... the tank is the first application of this mean of movement to the fighting units... we should forthwith prepare to raise the mechanical army we shall require and to select an area of operations suited to its tactics.²²²

Once again his fertile imagination ran far ahead of the realities of the current state of the tank.

This paper led me to see more clearly than I had ever seen before, that the decisive attack did not depend upon the locality of a tactical point or position; but that it lay in a strategical direction, namely in the rear of the enemy's army and that consequently the decisive attack should be directed against the enemy's rear in order to strike at the *foundations* [Fuller's italics] of fighting power.²²³

By August 1917, Fuller had clearly moved on from the earlier concepts of the tactical use of tanks to assist the infantry in the initial penetration of the first and second line defences to the more strategic role of attacking the enemy's rear nerve centres. This was a concept he developed more fully the following year.

Fuller claimed that his original paper was presented by Capper and Elles at a conference at GHQ, Montreuil, on 14 July 1917 but was rejected by Kiggell.²²⁴ Fuller subsequently amended and added to his original version a section on 'Tank Raids', including a proposal for a raid by tanks in the general area between St Quentin and

²²² Fuller, *Memoirs*, p.122

²²³ Fuller, 'Tactical Employment of Tanks in 1918', p.28

²²⁴ Fuller, *Memoirs*, p.130

Fuller, *Memoirs*, p.131

Cambrai. He later claimed this to have been the genesis of the Battle of Cambrai, although he was advocating a limited raid rather than a decisive action: 'my aim had nothing to do with fighting a decisive battle, for the area was not suited to such an operation.'²²⁵ Fuller, typically, sent copies of his revised paper to people of influence:

much doubting that GHQ would even deign to read it, I sent copies to General Sir William Furse [then MGO at War Office], to Lieutenant Colonel Stern, to 'Tom' Holland and to Mr. Winston Churchill, so that the seed might fall upon fertile as well as barren land.²²⁶

There is no evidence that any of the recipients actually read Fuller's verbose, 28 page missive or that it influenced the Third Army plans for the battle of Cambrai to any degree but it does seem co-incidental that Diagram 5 in Fuller's paper shows part of the area selected for the attack later in the year. Harris is somewhat dismissive of Fuller's claims.²²⁷ He and others have also emphasised the importance of the various developments in 'scientific gunnery' techniques used to good effect on the opening day of the battle.²²⁸

At much the same time, Fuller produced an uncharacteristically short memorandum on the development of tactics 'since August 1914, generally and especially in relation to Tanks and Mechanical Warfare.' Looking to the future, he wrote:

A total change of tactics is necessary- a surprise which the defence cannot deal with. We still have that power of surprise. Accumulate Tanks and continue to do so until you have thousands, well-trained and well-organised tactically into an efficient, self-contained Mechanical Army... this great force

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Fuller, *Memoirs*, p.175

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Fuller, *Memoirs*, p.175

²²⁷

Harris, *Men, Ideas and Tanks*, pp.104 -109

²²⁸

Bidwell, S. and Graham, D., *Firepower*, (Barnsley: Pen & Sword, 2004 [1982]), p.134

would consist of brigades of tanks of different designs, each organised for its own particular role; all organised under one head, who would be responsible for a Mechanical Army (trained with its complement of artillery and infantry, etc., until ready to complete its task) to win a decisive battle.²²⁹

The proponents of 'Mechanical Warfare' gained influential support. On 21 October 1917, Churchill in his role as Minister of Munitions, produced a lengthy and closely argued paper on the munitions programme for 1918, predicting that tanks would play a more significant role in the coming year:

the resources for next year will for the first time make available numbers of tanks with trained personnel sufficient not only to act as auxiliaries to the infantry in the main battle, but to provide forces necessary for attacks of their own under the most favourable conditions and on a very large scale.²³⁰

Lieutenant-General Sir William Furse, the MGO, felt that the conference did not show 'sufficient appreciation of the value of Tanks... I would urge that everything possible be done to expedite the output of the materiel [i.e.tanks] and that we should lay plans for doubling our present establishment.'²³¹

Fuller backed up his argument with copious statistics culled from the various operations where tanks did and did not take part, proving, in his view, that the use of tanks resulted in fewer casualties, reductions in manpower, and savings in expenditure. More detailed and less subjective analysis might well have supported another conclusion but Fuller ignored the simple fact that the tanks available at that time were unreliable, vulnerable to adverse ground conditions and there were not enough of them nor likely to be given the conflicting demands on limited supplies of materials and manpower.

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230 TM: E2006-1655:Fuller correspondence. Memorandum, 24 August 1917,

231 KCL Fuller papers, I/3/46

KCL Fuller papers, I/3/42

Major Stephen Foot produced a paper entitled 'Petrol versus Muscle'.²³²

From this he developed a memorandum called 'A Mobile Army' which he presented to General Capper:

Why not have a 'Mobile Army' of several Divisions, equipped with tractors to carry supplies of food and ammunition sufficient to enable them to advance for a period of six days? This would solve the problem of the holding out of strong-points and places of tactical importance that in the past had held up every advance...²³³

Capper passed the paper to the DCIGS and it became a subject at a WO conference on 'a Mobile Army'. A committee was formed to find suitable tractors to carry supplies, artillery and infantry rather than fighting vehicles. In due course these emerged; some were specially designed, some adapted from obsolete earlier marks of tanks.²³⁴

By late December 1917, as a result of increasing manpower problems and the transfer of German divisions from the Eastern Front, GHQ was adopting a more defensive strategy on the Western Front pending the arrival of Americans. A 'Memorandum on Defensive Measures' was produced by GHQ on 14 December 1917. However, it made no reference to the defensive role of tanks. As a result, Brigadier-General Elles sent a letter to GHQ on 4 January 1918 pointing this out.

Whilst protection must for some time to come depend primarily on Infantry and Artillery action, a mechanical striking force [must] be built up behind this shield so that offensive power may be added to the defensive imposed on us for the next several months.²³⁵

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²³³ Foot, Major Stephen, 'Petrol versus Muscle', *Tank Corps Journal*, 1 (6) (Oct 1919), pp.166-167. This is a copy of the paper written originally on 9 February 1918.

²³⁴ Foot, *Three Lives*, pp.198 - 204

²³⁵ Foot, *Three Lives*, p.201

Fuller, 'Journal', appx.A4

The accompanying memorandum, probably written by Fuller, tackled not only the defensive but also the offensive role of the tanks in the coming year. The author dismissed a 'passive defence' role for the tanks as an 'absurdity'. He argued that the two defensive operations for the tanks are: '(a) to forestall a hostile attack by a raid and (b) to counter-attack the enemy during or immediately after the attack.'²³⁶ Once again, he advocated the use of 'tank raids...A series of periodical Tank and Infantry raids made at various places down the British Front in the late spring and summer of 1918 would probably force the enemy to retain large forces on this front.'²³⁷ Co-operative tank training between the Allies would be required: '... a closer Tank liaison, both Tactical and Training should exist between the Tank Corps of these three nations than exists at present.' The author did not miss the opportunity to press his case for the massed use of tanks in an improved Cambrai type of operation. He finished by emphasising that: 'it is not the intention to lay down a definite or detailed tactics but to accentuate the possibilities of Tanks (especially those we shall be receiving in 1918) in both defensive and offensive operations.' He warned that 'the eventual counter to the Tank....can only be a Tank. We have an opportunity. Once Tank meets Tank, that opportunity will vanish. The opportunity may be fleeting.'²³⁸

Fuller produced a lengthy paper on 'Anti-Tank Defence' which was sent to GHQ on the 30 December 1917. While there was little evidence at that time that the Germans had their own tanks or were in the process of manufacturing them, 'it is

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TNA: WO158/835: War Office Correspondence: GHQ: Tank Corps: Tank Operations: 'Defensive and Offensive Use of Tanks in 1918', January 1918

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Fuller' Journal', p.3

²³⁸

Ibid, p.5

inconceivable' that they would not do so in the near future. Fuller envisaged anti-tank defence under various headings: artillery, using fixed anti-tank guns on likely tank approaches, using one or two mobile anti-tank guns in each artillery battery and by the use of bombardments on likely tank assault areas; infantry, using snipers to target loop-holes and vision slots in the tanks as well as grenades, and trench mortars and the use of tanks as anti-tank guns. He thought that the use of bombing or shooting by aircraft was also worth consideration. He also recommended the construction of entrenched anti-tank defences of at least 10,000 yards in depth to break up and exhaust any tank penetration. He called for action as soon as possible on these recommendations, particularly the identification of likely tank attack areas, the creation of an 'anti-tank defence line and the institution of tank and anti-tank courses.²³⁹ Once again, Fuller's visionary thinking was apparent and many of these ideas became reality in due course, but they did not reflect the practicalities at the time.

With training in mind, Fuller produced another lengthy paper (28 pages and 11 diagrams) on 'Infantry Co-operation and Training'. Perhaps mindful of the earlier fate of the more widely distributed 'Training Note 16', Fuller only sent this paper to all Tank Brigades with a caution on the front page: 'Until an amended copy is issued by GS, GHQ, this Training Note will be used for training Tanks and Infantry and for lectures. The principles laid down in it will be maintained... the following Training Note is issued in continuation of the instructions laid down in SS.135, Chap. XVI, which should be read in conjunction with it.'²⁴⁰ The implication was that Fuller was

²³⁹

Ibid,appx.A5 'Anti-Tank Defence', 30 December 1918,

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Ibid,appx.A20 'Infantry and Tank Co-operation', 27 January 1918,

not satisfied with the tank-related operational doctrine and training instructions so far produced by GHQ, an aspect which will be considered later.

Fuller describes the characteristics and limitations of the current tank for the benefit of the infantry. There is then a lengthy discourse on 'The Problem of Firepower' where Fuller rather surprisingly claimed that: 'Today, as formerly, we find that the bayonet, or hand-to-hand fighting, is the true weapon of offence, and that bullets and shell - weapons for fighting when at a distance and... [are] but a means to defend the bayonet until it can be deployed.' He emphasised that:

All ranks must realise that the tactics required for Infantry and Tank Co-operation is in detail different from what infantry have recently been asked to carry out... this necessitates:-

- (a) Quick initiative amongst leaders, especially Section Commanders.
- (b) Quick movement of the Section²⁴¹

By means of text and diagrams, Fuller then described in considerable detail, a number of 'typical' scenarios; infantry and tank attack against trenches, against strong-points, on woods and in villages. For each of these situations, Fuller described appropriate training exercises. He finished with a section on anti-tank defences.

In this short period of productive output, Fuller produced one further paper on 28 January 18, entitled 'Tank operations Decisive and Preparatory, 1918-1919'.²⁴² According to Fuller, he produced this in response to a letter from Kiggell ordering 'us to distribute our four Brigades... as follows; 1st Brigade to First Army, 2nd & 3rd Brigades to Third Army and 4th Brigade to Fifth Army. Though this facilitated training, all training was to be of a defensive nature, and considering this

²⁴¹

Ibid, pp.4-5

²⁴²

Ibid, appx.A8 'Tank Operations Decisive and Preparatory 1918-1919', 28 January 1918,

unsatisfactory, I wrote another study entitled 'Tank Operations Decisive and Preparatory 1918-1919' which Elles forwarded to CGS on January 28.²⁴³

The paper was a foretaste of Fuller's more well-known later study, 'Plan 1919'. In this earlier study, Fuller considered the operations that would be required for the decisive battle in 1919 and the preparatory measures necessary during the 1918 operations. He believed that the decisive battle required a holding battle along the entire 400 miles of the Western front to draw in enemy reserves, combined with an initial penetration on a front of 100 miles, and sufficient forces to exploit the penetration achieved. He believed that such an operation using infantry and artillery alone would be impossible. However, using 'mechanical means it becomes feasible with a comparatively small force.' He estimated that such an operation would require 12,000 tanks in all and 240,000 men. He acknowledged that Britain alone could not produce these resources but that, if Britain, America and France could produce one third each, Britain's share would be 4,000 tanks and 80,000 men, the equivalent of four infantry divisions.²⁴⁴ Given the acute shortages of both manpower and material among all the Allies, this proposal was clearly unrealistic.

Fuller set out the detailed tactical requirements for his 'decisive battle of penetration' involving the initial penetration on a broad base and the securing of the flanks so formed. 'The Tank is eminently suited to carry out these acts.' He listed the types of mechanical vehicles that would be required;

- (a) Tank crossers (Subsidiary uses:- Carriers, Mortar Tanks, Artillery Tanks, Bridging Tanks).
- (b) Water crossers.
- (c) Tank Destroyers (Subsidiary use:- Wood crossers).²⁴⁵

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Fuller, *Memoirs*, p.234

²⁴⁴

Fuller, 'Journal', p.3

²⁴⁵

The elongated Mark VIII tank, then under construction, would be the necessary vehicle.

Fuller included a section on 'Mechanical Warfare'. 'The Tank will protect the infantry machine gunners from the enemy's machine gunners, and the aeroplane the Tank from the enemy's artillery. Low flying aeroplanes must be bullet-proof; in fact they must become flying tanks. Here is the solution to our problem "how to make the most of our man-power in the battles which face us next year".²⁴⁶

Turning to the preparatory operations during 1918, Fuller once again championed the use of two types of 'Tank Raids'-; the 'deep raid' on a narrow front and a 'shallow raid' on a broad front. Drawing comparisons from Cambrai, Fuller estimated the likely casualties and numbers of prisoners taken in a raid. Whilst his calculations were somewhat speculative, Fuller finished by posing the rhetorical question: 'Whether shallow raids or deep ones are the best [Fuller's emphasis] form of bettering our tactical position is immaterial. Mechanical Warfare does offer a solution.... If it is not the best solution then what solution is a better one?'²⁴⁷

Whether this latest paper by Fuller had any influence on GHQ is debatable. Fuller himself acknowledged: 'The new CGS²⁴⁸ read this paper, or possibly he did not; for on February 4th it was returned to us without a word of comment.'²⁴⁹ It seems that GHQ was not swayed by Fuller's proposals for a more aggressive use of tanks in future operations because, on 13 February 1918, GHQ issued an order to First,

²⁴⁶ Ibid, p.4

²⁴⁷ Ibid, p.5

²⁴⁸ Ibid, p.7

²⁴⁹ Lieutenant-General H A Lawrence replaced Kiggell as CGS on 24 January 1918

Fuller, *Memoirs*, p.237

Third, Fourth and Fifth Armies and the Tank Corps regarding the 'principles to be observed in the employment of the Tank Corps in the defensive.' GHQ instructed that the use of tanks would be:

restricted to assisting in re-establishing the battle or rear zones by counter-attack...tanks may be used in two ways:-

(a) without infantry support-within 24 hours of a hostile assault- for the purpose either of checking an attack that has succeeded in penetrating the battle zone, or to disorganise the enemy's next bound.

(b) in co-operation with other arms in the deliberate counter-attack.

In the latter case the operation was to be conducted along the lines of the Battle of Cambrai and in accordance with instructions laid down in *SS135 The Training and Employment of Divisions in 1918* (to be discussed later). The instruction emphasised that tank units should be concentrated together because, 'if dispersed forward, great damage will be done to signals communications and light railways by lateral movement.'²⁵⁰ Given that GHQ could not with absolute certainty predict where the anticipated German attack was likely to fall, the dispersal of the Tank Corps assets as a GHQ reserve across the British front, concentrated with a Tank Brigade to each Army, was eminently practical and sensible. GHQ went further and, at a Conference held on 2 March 1918, Haig, after consulting with General Gough, proposed that the tanks be used as strong points or, as Fuller referred to them, as 'Martello Towers'.²⁵¹ This later developed into a concept, known dismissively within the Tank Corps, as the 'Tactics of the Ferocious Rabbits', whereby individual tanks would remain hidden in specially prepared pits, to emerge and engage enemy

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TNA: WO158/832: War Office Correspondence: GHQ: Tank Corps: Employment of Tanks: *SS 135 The Training and Employment of Divisions in 1918*

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Fuller, *Memoirs*, p.240

penetrations.²⁵² Thus, the defensive doctrine changed from tanks being dispersed in concentrated groups to a thin cordon of individual tanks.

Fuller followed the instruction from GHQ with his own to the Tank Brigades.

In it he emphasised:

The main principle to work on is concentration of force, dispersion must be guarded against. When discussing action with Armies, etc., it must be pointed out that tanks have not been distributed forward in order to take part in local counter-attacks. They are in general reserve and consequently their action must coincide with the normal action of such a reserve, that is the decisive counter-attack in the Battle or Rear Zone.²⁵³

In the absence, at that time, of a tank advisor at GHQ it seems that Fuller was seeking to use the Tank Brigade commanders to influence the various Army Commanders' use of tanks in their coming operations.

In a strategic overview written on 26 February 1918 of how the war might progress in 1918, Fuller once again emphasised the 'Mechanical Solution to the War':

We must bank not on men but on Machines. We must bank on the cannon, on the Machine Guns, on Tanks, on Aeroplanes and on gas. If we are to win the war in 1919 we must absolutely outpace all possible mechanical productive ability of Germany forthwith. As regards Tanks alone, we shall require 12,000 to 15,000... This is a possible solution. It may not be the best possible solution. If a better can be found, then what is it?²⁵⁴

No doubt frustrated by what he saw as inertia at GHQ, Fuller, as was his wont and ignoring military protocol, wrote direct to Winston Churchill, the Minister of Munitions, on 2 March 1918. He justified this by stating 'I feel it is my duty, whatever consequences may follow, to set frankly before you the following considered

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Fuller attributes this concept to General Ivor Maxse of XVIII Corps. Ibid, p.240.

253

Fuller, 'Journal', appx.A11. Fuller to Tank Brigades, 23 February 1918

254

Fuller, 'Journal', appx.A13. 'The War in 1918 – a Forecast', 26 February 1918.

opinions relative to this subject [i.e. the possibilities of ending the war by mechanical means].’ Fuller saw three main problems: ‘GHQ is inert and will lay down no policy... this means that the Cabinet must decide on the 1919 Tank policy, whether GHQ likes it or not’; second, ‘no efficient higher organisation exists in the Tank Corps’. Fuller’s solution to this was ‘we want a Director General, one head, for preference a civilian, unshackled by 1870 tactics, who has direct access to the War Office, GHQ and the Ministry of Munitions... The Headquarters Tank Corps to be done away with and replaced by a General Staff Officer and an Administrative Staff Officer at the War Office.’; third, ‘Design and Production are not assured ... Design requires a man who knows what we want in France. Production requires a man who is an expert in production.’ Fuller then went so far as to propose Lieutenant Colonel Searle, the Controller of Tank Workshops in France – ‘ he is one of us, he knows what we want’- as the suitable man for the job.²⁵⁵

Even by Fuller’s standards, this letter sent from a non-substantive Lieutenant Colonel direct to a Minister of State, criticising the higher command and proposing changes at the War Office was breathtakingly arrogant and naive. Fuller himself acknowledged; ‘as an unconventional soldier I am breaking all the rules of military etiquette by writing this letter to you. I am not a conventional soldier, and I consider that I should be siding with the enemy if I was afraid of taking the action I am now taking.’²⁵⁶ Fuller received a somewhat terse response from Churchill, thanking him for his note, pointing out the competing demand of the shipyards with tank

255

Ibid. appx.A12. Memorandum, Fuller to Churchill, 2 March 1918.

256

Ibid.p.2

production and telling him, politely, that he did not intend to make the personnel changes recommended by Fuller.²⁵⁷

With the anticipated German offensive imminent, Fuller turned his energies to operational and training matters. He produced a 'liaison scheme' among the Tank Brigades 'in order to establish a uniform system of collecting and transmitting information, throughout all units of the Tank Corps, regarding operations at fixed hours.'²⁵⁸

On 20 March 1918, Fuller produced an instruction on 'Training in the Forward Area'. In it he emphasised the need for reconnaissance training, which could be carried out over the actual routes to be used in battle, on observation training, on the techniques of 'map layering', on night work and the use of aeroplane photographs.²⁵⁹ On 25 March 1918, he produced instructions for the improvised Lewis Machine Gun Battalions that had been formed from the Tank Brigades that were no longer equipped with tanks through battle casualties. On 29 March, eight days after the Germans initial assault began, Fuller hastily produced instructions on 'Tanks in Rear Guard Actions'.

Just before the German offensive began on 21 March, Fuller produced another lengthy paper:

On the 18th [March] I corrected a long paper I had been preparing for some time past. It was entitled 'Tank Programme 1919' and was in fact a kind of Tank encyclopaedia covering the whole problem from the tactical, administrative, manpower and production points of view. Again it was pointed out that large raids would disorganise the enemy and compel him to break up his concentrations and once again it was stressed that 'there is no

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Ibid, appx.A12. Churchill to Fuller, 8 March 1918.

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TNA: WO158/840: War Office Correspondence: GHQ; Tank Corps: Tank Corps Meeting & Correspondence: 'Scheme for Battle Liaison', 11 March 1918

²⁵⁹

TM: E2007.3206:Fuller, 'Training in the Forward Area', 20 March 1916

other military solution to this war than the exploitation of mechanical means to the fullest...'²⁶⁰

This paper was indeed largely a compilation of previous papers written by Fuller into a single document of 21 pages and five appendices and contained few new insights.²⁶¹ Fuller recorded that it was taken to GHQ by Elles on 19 March 1918.²⁶² Probably because of the confusion and panic caused by the German offensive two days later, nothing more is heard of it. Twelve days later, however, after he had had the opportunity to consider the initial lessons from the German assault, Fuller produced a short revision to his paper.²⁶³ 'The present German offensive necessitates the partial recasting of ideas as regards the employment of tanks next year.' He foresaw the operational difficulties of advancing back over the 40 miles of devastated ground recently taken by the Germans. In his view, this strengthened his case for the increased production and use of mechanical vehicles, particularly the new Mark VIII heavy tank and a lighter Medium tank.

Once the initial panic over the German offensive was out of the way, Fuller resumed his work on training. 'I first got out a note for our own people on "Elementary Tank Tactical Training" because, since the savage-rabbit insanity was introduced, training had gone to the wall: further, casualties had further reduced the tactical knowledge in units. This note was a short one, suggesting: the weekly issue

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Fuller, *Memoirs*, p.247

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Fuller, 'Journal', appx.A21, 'Tank Programme 1919',

²⁶²

Ibid, entry for 19 March 1918

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Confusingly, Fuller also called this shorter paper, 'Tank Programme 1919'. It was subsequently amended to 'Strategical Outlook 1919'. 30 March 1918. Fuller, 'Journal', appx.B.11

of a Brigade tactical note; 10 minute lectures to all ranks on these notes; Company tactical exercises based on these lectures and so on up to Battalion Exercises.’²⁶⁴

The Notes began with this introduction:

There are many Subordinate Tank Commanders at the present moment who, when questioned, display a complete ignorance of Tank and other tactics even of the most elementary nature; this is a serious danger. It is fully realised that during the last few months training facilities have been limited and much time expended on Tank Maintenance and the mechanical side generally. There is no doubt that mechanical knowledge has greatly increased. Now what we want to arrive at is the policy to apply this knowledge tactically – that is, according to the following points:-

- (a) Ground
- (b) Formation and action of the Infantry
- (c) The resistance that the enemy is putting up

Without this close co-operation between the mechanical side and the tactical side, there can be no success – only friction and disappointment.²⁶⁵

After witnessing the catastrophic the effect the German offensive had had on the British command system, particularly in Fifth Army, Fuller began to formulate new thoughts on operational doctrine for the tanks for the coming year.

PLAN 1919

Fuller produced the doctrinal paper for which he is probably best known on 24 May 1918. It originally had the rather grandiose title of ‘The Tactics of the Attack as affected by the Speed and Circuit of the Medium D Tank’, later to be known simply as ‘Plan 1919’.²⁶⁶ As the original title implies, the paper came about because new

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Fuller, *Memoirs*, p. 278

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KCL Fuller papers, I/2/47, ‘Notes on Elementary Tank Tactical Training’, 21 May 1918.

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Two versions of ‘Plan 1919’ exist. Fuller’s original, unedited, hand-written draft is in his Journal at the Tank Museum Library. Fuller, ‘Journal’, appx.B62. A later edited version is to be found in KCL Fuller papers, I/50/1-8. It is also reproduced, nearly verbatim, in Fuller, *Memoirs*, pp.322-336

tactics needed to be developed with the anticipated arrival of the latest type of medium tank, the Medium D. 'From the idea of the machine [the Medium D]... on 24 May I worked out an entirely novel system of tactics.'²⁶⁷

Medium or 'chaser' tanks had been around since late 1917 and were designed to exploit a breakthrough made by the heavy tanks. The Medium A 'Whippet' tank, of which 200 were produced, had proved their worth in various actions during 1918. Although faster than the heavy tank (up to 8 mph compared with around 4 mph), the Whippet was still too slow, and mechanically unreliable, to be a serious weapon of pursuit. Two improved versions followed but none made it to the battlefield. At a conference on 28 April at HQ Tanks, the specifications for an improved medium tank were laid down –a speed of 20 mph, a range of 200 miles and a weight of not more than 20 tons.²⁶⁸ It was the promise of this machine, together with the much improved Mark V heavy tank, that led Fuller to produce his 'Plan 1919'.

Using the analogy of the human body, Fuller emphasised the need to go for the enemy's 'brain'- his headquarters and command centres, before attacking his 'limbs' – his supply routes and fighting arms. His plan was to use large numbers of armoured vehicles in three roles: a 'Disorganising Force' of Medium Ds to breakthrough and thrust up to 20 miles behind the front line targeting headquarters in rear; a second 'Breaking Force' of infantry, tanks and artillery would then make the major penetration of the front-line defences and, once penetration had been achieved, a 'Pursuing Force' of Medium Ds and lorry or carrier borne infantry would

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Fuller, *Memoirs*, p.281

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Fuller, 'Journal', appx. B46 Minutes of 'G ' Conference, HQ Tanks, 28 April 1918.

pursue the fleeing enemy. To achieve all this, Fuller estimated the British contribution to be around 3000 tanks of all types and 37,000 personnel.

Fuller's paper was a combination of previous ideas and new insights. It can be criticised on a number of grounds; first, it is based on the premise that large numbers of Mark VIII Heavy and Medium D Tanks would be available for a planned offensive by mid-1919. In reality, tank production had to compete in terms of both labour and material with other war requirements, notably shipping, and it was unlikely that sufficient tanks would be produced on time. The Mark VIII was unproven in battle as only five had been produced by the Armistice. Similarly, the Medium D, although it showed promise, was untried and had not yet been produced in bulk. Second, Fuller ignored any advances that the Germans might have made by mid-1919 in terms of their own tank production and effective anti-tank measures. It was naive to think that the Germans would not have developed effective counter-measures. Lastly, there was the question of man-power. Even with the American contribution, it was speculative whether, politically or in reality, additional manpower would have been found to carry through Fuller's plans.

In reality, of course, 'Plan 1919' was never put to the test. In Holden Reid's words: "Plan 1919' must be the most famous unused plan in military history.'²⁶⁹ Its fame rested largely on its influence on the development of mechanised warfare in the inter-war years, a subject which is outside the scope of this thesis.²⁷⁰ Nonetheless it is interesting to chart its subsequent progress through the military

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Holden Reid, *Fuller, Military Thinker*, p.48

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For the development of mechanised warfare in the interwar years see Martel, Lt. Gen. Sir G Le Q *Our Armoured Forces* (London: Faber and Faber, 1955); Liddell Hart, Captain B H *The History of the Royal Tank Regiment and its Predecessors, The Heavy Branch Machine Gun Corps, Tank Corps, & Royal Tank Corps 1914-1945. Volume I. 1914 - 1939* (London: Cassell, 1959)

command system and evaluate the role played generally by GHQ, WO and the Supreme Headquarters in developing tank operational and tactical doctrine.

THE INVOLVEMENT OF HIGHER COMMAND IN TANK DOCTRINE

Although Haig's support for the tanks did not meet Fuller's unrealistic expectations, Haig and GHQ generally could not be accused of being hostile to the use of tanks in favourable circumstances. GHQ also became involved to some extent in the production of tank tactical and operational doctrine.

In his analysis of the doctrinal instructions produced by GHQ, Beach discovered that out of hundreds of SS instructions produced by GHQ between March 1916 and the end of the war, of the 65 that related to operational and doctrinal matters, only six related specifically to tank matters. (By comparison 12 were on artillery matters). Of the six only three: *SS 164: Notes on the Use of Tanks and on the General Principles of their Employment as an Adjunct to an Infantry Attack*, May 1917; *SS 204: Infantry and tank co-operation and training*, March 1918, and *SS 214: Tanks and their employment in co-operation with other arms*, August 1918, could be considered strictly tank operational doctrine.²⁷¹

A Training Directorate had been established at GHQ on 30 January 1917, under Brigadier-General Arthur Solly-Flood, with the intention of codifying and disseminating doctrine within the BEF and rationalising the training system.²⁷² It seems likely that the first formal tank-related publication from GHQ, SS 164,

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Beach, J, 'Issued by the General Staff: Doctrine Writing at British GHQ, 1917-1918', *War in History*, 19 (4) (2012), pp. 464-491

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See Geddes, Alistair, 'Solly-Flood, GHQ, and Tactical Training in the BEF, 1916-1918' (Unpublished MA dissertation, University of Birmingham, 2007)

published in May 1917 was produced by the Training Directorate. Dismissed by Fuller as a 'slim volume', the instruction served to give front line formations information about the characteristics and limitations of the improved Mark IV tank, then making its first appearance on the battlefield.

It was thin on doctrine as such, admitting that only limited combat experience was available. It did point out, however, a number of operational considerations which became enshrined in tank doctrine:

the action of the artillery and the employment of tanks should be carefully co-ordinated... The best moral effect is obtained... from the employment of large numbers of tanks attacking several objectives simultaneously... a proportion of tanks should be kept in reserve... it will seldom be advisable to detail less than a section of tanks for any one objective... very careful previous reconnaissance is essential.²⁷³

There were several matters which proved controversial in due course: 'It should seldom be necessary to employ tanks at the commencement of an offensive to assist the infantry assault on a hostile front system of trenches, which can be adequately dealt with, and destroyed, by our own artillery bombardment.'²⁷⁴ In reality, it was the prolonged artillery bombardment that in many cases rendered the ground unsuitable for tanks. On the question of 'flattening sunken or concealed wire which cannot be cut by artillery fire' the instruction stated 'the chances of success are not great, and their use for such an abnormal use should be rare.'²⁷⁵ In practice, admittedly once a method, i.e. grapnel hooks, had been developed, the crushing and clearing of wire became one of the principal tasks for the tanks.

²⁷³

Ibid, pp. 2-3

²⁷⁴

Ibid,p.3

²⁷⁵

Ibid, p.4

No further tank-specific doctrinal instructions were produced until the publication of *SS 204: Infantry and Training Tank Co-operation and Training* in March 1918. Fuller claimed to be the original author of this paper. 'For some time now I had urged that my paper on "Infantry and tank Co-operation and Training" which we had issued to our own units on January 27 should be printed for circulation down to Battalions. He [General C Bonham-Carter at GHQ] told me it could not possibly stand as it was written and when I asked " why?", he replied: "it is not written in "GS" language." ²⁷⁶. An edited version was produced by the Training Directive in March and its content was essentially as already described.

The third of the three doctrinal papers was *SS 214: Tanks and their Co-operation with other Arms* published in August 1918. This we know was written by Major Cuthbert Headlam, the editor of numerous publications emanating from the Training Directorate at GHQ.²⁷⁷ Fuller recorded Headlam visiting Tank HQ. 'I received a request... to give all assistance to Major C Headlam, who had been instructed to write a Tank Manual. At the time it seemed a little strange that I had not been asked to do so; for thus far all notes, etc., on tank tactics and training had been written by myself... He stated quite frankly that he knew nothing about tanks.'²⁷⁸ Headlam briefly recorded this meeting, 'satisfactory meeting with Fuller. Lunched with the Tank people and saw an interesting demo afterwards.'²⁷⁹

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Fuller, *Memoirs*, p.242

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Beach, 'Doctrine Writing', p.482

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Fuller, *Memoirs*, p.283 and Fuller, 'Journal', entry for 3 & 4 June 1918

²⁷⁹

Headlam diary entry, 9 July 1918 in Beach, J., (ed.), *Military Papers of Lieutenant Colonel Sir Cuthbert Headlam 1910-1942* (Stroud: History Press for the Army Records Society, 2010) p.205

SS214 was issued in August 1918 and superseded both SS164 and SS204 as well as the brief mention of tanks in SS135. It was a very much more comprehensive document reflecting the lessons learnt since publication of the previous documents. It probably arrived in the hands of the Corps and Divisional Commanders too late to influence the operations beginning in August 1918. There was great emphasis on co-operative training between the tanks and infantry with an appendix devoted entirely to this aspect. Notes on co-operation with aircraft were included for the first time.²⁸⁰

Headlam's own comments on the reaction to the publication were: 'I find my Tank Book has made me quite famous – because I have succeeded in producing a work on a disputed subject to which no-one can find an objection.'²⁸¹ Fuller had another view. He made one further dismissive comment on this document when he wrote direct to the DCIGS on 5 June 1918: 'Genl. Dawnay... decided that a tactical manual on Tanks should be produced. I offered to take this on, but instead a GSO2 at GHQ who knows nothing about Tanks at all has been detailed to do this work. I saw some of his notes – he has not a tactical idea in his head, let alone any knowledge of Tanks... please excuse me for being so frank...'²⁸² Typically, Fuller's comment was somewhat caustic, reflecting the fact that he was not chosen for the task. Headlam was given the task of collating various differing views on the operational use of tanks. He was not, and admitted as such, a 'tank expert' and took

280

SS214: *Tanks and their Co-operation with other Arms* (GHQ, August 1918) p.9

281

Headlam diary, 3 July 1918, in Beach, *Headlam Papers*, p.205

282

Fuller, 'Journal', appx. B69

pains to talk to Fuller and others on the subject before producing a balanced doctrinal document for the benefit of all users, not just the Tank Corps.²⁸³

Following changes of appointments at WO after Robertson's resignation in February 1918, and as Inter-Allied co-operation progressed, higher command showed increasing involvement in tank doctrine. General 'Tim' Harington, on his appointment as the new DCIGS, could find no comprehensive policy on the employment of tanks at WO or at the Supreme Headquarters at Versailles. In a letter of 21 May to Major-General J. Sackville-West, the British Military Representative at Versailles, he wrote:

Re Tanks, I am trying hard to get a General Staff Policy laid down and am now waiting for a reply from GHQ France on certain points. It is quite hopeless at present and there are far too many people playing with it. I have got CIGS to agree that he will produce a GS policy in a few days which must be our doctrine... and so get some systems into the business and stop all this outside pressure of views by cranks by every post.

I have had more difficulty in getting the hang of the Tank question since I arrived than all the other questions put together.²⁸⁴

Major-General Guy Dawnay at GHQ professed himself 'at sea' over the question of tank doctrine. In not recommending Fuller's appointment to the proposed Inter-Allied Committee at Versailles, he wrote:

I do not think that he represents the General Staff view here at the least. In fact he represents an extreme Tank view, which is a view to which the Tank Corps in France has been unable to secure the adhesion of the General Staff... I do not know the views of the General Staff. The fact is... the views of the General Staff have not solidified on the subject. We have not enough data on which to base a body of tactical doctrine at present.²⁸⁵

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Headlam diary entry for 3 July 1918, Beach, *Headlam Papers*, p.205

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TNA: CAB 25/12/36: Supreme War Council: Tanks and Mechanical Warfare: Letter, Harington to Sackville-West, 21 May 1918

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TNA: CAB 25/12/34: Supreme War Council: Tanks and Mechanical Warfare: Letter, General Dawnay, GHQ, to Sackville-West, 26 May 1918

On 23 May 1918, Sackville–West forwarded two papers written by his staff officers to Harington.²⁸⁶ In his covering letter, he expressed his concern about the lack of a common doctrine for tanks among the allies:

we must get a G.S. policy of employment [of tanks] evolved and accepted...if we can get a policy, allocation of tanks and construction, etc, may be easy but at present, everyone is pulling in opposite directions – Capper in England, Stern in Paris, Ellis at G.H.Q. and G.S. at G.H.Q.: unless some definite policy is adopted and adopted at once, there is very little hope of progress.²⁸⁷

Harington sent Sackville-West on 30 May 1918, a 'preliminary General Staff policy of which the C.I.G.S has approved and I am waiting for remarks on it from France.' He stated: 'I am absolutely certain we must get tanks brought inside the Army and their policy controlled by General Staff... In the meantime, no-one is more anxious than I am to get this business on proper lines.'²⁸⁸

The General Staff policy was a comprehensive, succinct document listing 12 tank policy matters 'to be put in hand forthwith.' A large scale offensive using tanks was planned for around June 1919 on a frontage of between 40,000 and 100,000 yards using fighting tanks, infantry carrier tanks and cavalry. The basic tactic was to be a breakthrough with tanks and carrier-borne infantry with Lewis guns. These would hold the ground until the arrival of infantry on foot. Infantry and supply tanks would be used to bring up supplies so that another advance could be made without delay. Further tanks would exploit the flanks to widen the breach and smoke would

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TNA: CAB 25/12/46-52: Supreme War Council: Tanks and Mechanical Warfare, 14 May 1918 and TNA: CAB 25/12/42: Supreme War Council: Tanks and Mechanical Warfare, 22 May 1918

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TNA: CAB 25/12/35: Supreme War Council: Tanks and Mechanical Warfare: Sackville-West to Harington, 23 May 1918

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TNA: CAB25/12/30: Supreme War Council: Tanks and Mechanical Warfare: Harington to Sackville-West, 30 May 1918.

be used. In order to implement this policy, CIGS wanted the output of carrier and supply tanks increased at once. In view of manpower shortages, it would be impossible to increase the number of Tank Corps personnel so ASC and other personnel would be transferred temporarily to man the infantry carrier tanks. British Tank Corps schools were to be established by early autumn 1918 to demonstrate proposed operations and the same methods would be used by the Allied School of Instruction then being set up. The CIGS wanted these proposals to be shared with the Allies at Versailles to see what they could assist with in terms of tanks, tank personnel and infantry.²⁸⁹

This document represented the first positive direction on the matter to emanate from the CIGS and the War Office in the absence of any existing policy and reflects the 'new broom' approach by the new CIGS, General Sir Henry Wilson and his deputy, Harington. Haig had a staff paper prepared on the proposals and responded to the War Office on 12 June 1918 with his views on tank policy. He stated that he 'found it difficult to formulate, except on very general lines, an opinion on a matter which cannot be considered from the point of view of the British Army alone.' He felt that the proposed proportion of tanks to infantry to be faulty, the tank force being too large and the infantry force too small. He did, however, agree that a large force of tanks would be an invaluable adjunct to a general offensive. He was 'strongly of the opinion that units of the fighting Tank Corps must take their place as Army and Corps Troops, and further that Gun Carrier Tanks, Infantry Carrier and Supply Tanks, Trench Mortar Tanks, etc, must be handed over to the Artillery, Army Service Corps, etc, instead of forming part of the Tank Corps.'²⁹⁰ A few days later,

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TNA: CAB25/12/31: Supreme War Council: Tanks and Mechanical Warfare: CIGS Tank policy, 26 May 1918

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he wrote again giving his view that Tank Corps HQ in France 'should be formed into an experimental headquarters and tactical training school... it is agreed that officers of the General Staff, Administrative Staff and Commanders of formations should study at this school and that anti-tank tactics should also be a subject of instruction... the formation of a central inter-allied school should be desirable for the purposes indicated.'²⁹¹

Fuller's 'Plan 1919' re-emerges at this stage in an altered form. According to Fuller,

Concerning this plan so far as I am aware, nothing happened until July 1, when General Capper placed a paper entitled 'Armoured Striking Force for 1919' before the C.I.G.S.; a paper representing the 'G.S. edition' of my Novelette [ie. Plan 1919] in which picturesqueness vanished in arithmetic... later in the month a letter was drafted for C.I.G.S.'s signature to be despatched to G.O.C. Allied Forces [General Foch]. It dealt with the 1919 offensive numerically not ideologically. In it was openly stated that it was 'not necessary to consider the actual method of attack', which was not very helpful for the recipient.²⁹²

He also commented:

The 'Memorandum on the Requirements for an Armoured Striking Force for an Offensive in 1919' was based on Capper's paper of July, which, in turn was based on mine of May 24 [i.e. Plan 1919].²⁹³

In his covering letter to General Foch, Wilson explained that the plan 'is based on the employment of tanks on a large scale.' He suggested to Foch that 'we obtain a definite decision from the Supreme War Council that it shall be carried out.' He made the following three points for Foch's consideration:

²⁹¹ Fuller, 'Journal', appx. B72, Haig to War Office, 12 June 1918.

²⁹² TNA: WO158/830: Director General Tank Corps Correspondence: Haig to War Office, 26 June 1918

²⁹³ Fuller, *Memoirs*, p.336

Fuller, *Memoirs*, p.338

- (i) That an allotment be made between the Allies as to what forces they are to raise and what material they are to provide
- (ii) That the whole-hearted concurrence of the Allied Governments and of the Armies must be given to the scheme and their utmost efforts be made to render it effective.
- (iii) the appointment of a small body of officers representing each Allied Nation to assist you in co-ordinating all work in connection with tanks.²⁹⁴

Wilson's paper was clearly based on Fuller's Plan 1919, in some cases using the same phraseology. His proposed plan for 1919 was essentially the same as Fuller's: an attack on a broad front of 160 kilometers of which 80 kilometers would be penetrated by medium tanks targeting 'the brain and stomach of the enemy'- the headquarters and communications; the reduction of the artillery preparation to the minimum; assist in getting forward guns, ammunition and supplies and make it possible to carry out a rapid and sustained attack and 'provide the means of pushing the blow beyond the range of our field and medium artillery and ... ensure penetration of the enemy's main system of defence.'²⁹⁵

In order to achieve this, Wilson's plan required large numbers of Medium tanks for the initial penetration capable of travelling long distances and able to cross wide trenches and rivers, large numbers of heavy and light tanks to support the infantry and large numbers of 'cross country mechanical vehicles' in support. The paper went into some detail on the tactics of the attack, detailing the requirements for wire-crushing tanks, bridge-layers and communications tanks. The numbers of troops required for such an attack were calculated at 70 divisions and tanks of all kinds at 10,500 of which the British share would be around 3,000. Wilson concluded by emphasising that 'no time should be lost in deciding the broad lines of the

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²⁹⁵ TNA: WO158/842: War Office Correspondence: GHQ::Wilson to Foch, 20 July 1918

TNA WO158/842. 'Memorandum on the Requirements for an Armoured Striking Force for an Offensive in 1919'. 20 July 1918

scheme and more particularly on the numbers of tanks, etc which will be required.' He was realistic enough to point out that the provision of tanks in time might well be the limiting factor.²⁹⁶

The same criticisms of Fuller's plan can be applied to Wilson's. It was essentially a plan for the future conduct of the war into 1919 based on a number of untested assumptions. Critically, it relied on the provision of sufficient numbers of a medium tank whose design criteria had been agreed upon but was still at the experimental stage. Nonetheless, Wilson's paper represented practically the final involvement of higher command, the War Office, the Supreme War Council and GHQ, in tank operational matters. Fuller was posted to the War Office to set up the new tank branch, SD7, there and devoted his energies to the re-organisation of the Tank Corps 'to bring it more into the Army', the details of which are outside the scope of this thesis.

CONCLUSION

Tanks first went into action in 1916 using tentative operational and tactical doctrine based on the best guesses of a few enthusiasts but without any combat experience to go on. As the tank crews and commanders gained more experience, so doctrine developed and training methods evolved to put theory into practice. It required the enthusiasm and persistence of such luminaries as Fuller and Elles to develop and codify tank operational doctrine and persuade some elements of the higher command of the potential of the tank. Throughout the period under consideration, the tank proponents had to face the realities of competing demands on limited

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resources of both manpower and materials which limited the actual numbers of available tanks. Unreliability, limited range and speed constantly dogged the effective use of the weapon, despite significant improvements in design. Nonetheless, by the time of the Armistice, WO, the CIGS and the Supreme War Council had become fully involved in the development of tank operational and tactical doctrine and there is little doubt that, had the war continued into 1919 and beyond, the tank might well have developed greater potential, though possibly not to the degree predicted by Fuller.

The next chapter will consider how the doctrinal theory translated into practice in the various tank engagements of 1917 and 1918.

CHAPTER FOUR: THE REALITY – TANK ACTIONS, DOCTRINE AND TRAINING

This chapter will examine the extent to which the major tank operations followed existing doctrine or, conversely, materially brought about changes in doctrine and training for subsequent actions in the light of combat experience and mechanical developments of the tanks.

ARRAS - 9 APRIL TO 16 MAY 1917

The Battle of Arras was a diversionary attack by the British Army in support of General Nivelle's offensive on the Aisne, some 50 miles to the south. British tactical and operational doctrine in general had been set out prior to the battle in two publications. The first edition of *SS135 Instructions for the Training of Divisions for Offensive Action* was published in December 1916 and *SS143 Instructions for the Training of Infantry Platoons for Offensive Action* in February 1917. Whilst these both radically changed tactical and operational doctrine for the infantry, there was little mention of tanks. SS135 merely states that, 'In the present state of their development, tanks must be regarded as entirely accessory to the ordinary methods of attack, i.e. to the advance of Infantry in close co-operation with the Artillery.'²⁹⁷ For tactical doctrine, the tanks had to rely on Fuller's 'Training Note 16', discussed above.

Commanders had expected to have 96 tanks of the improved Mk IV pattern available for the beginning of the offensive. Because of the delays in production, only 60 tanks were available and these were a mix of old Mk Is and Mk IIs, and even

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SS135 Instructions for the Training of Divisions in Offensive Operations, December 1916, Sec. XIV

25 unarmoured Mk III training tanks hurriedly rushed out from Bovington. Forty tanks were allocated to Third Army in the centre, twelve to Fifth Army on the right flank and eight to the Canadian Corps of First Army, for its assault on Vimy Ridge to the north.²⁹⁸

Generally, the contribution of the small number of tanks distributed in penny-packets across the entire 32,000 yard frontage of the offensive was limited and fell far short of the expectations of the Heavy Branch commanders. At the end of the offensive, the various tank unit commanders submitted their after-action reports.²⁹⁹ A conference of all tank unit commanders involved from Brigade down to Company and Workshop Commanders was held on 26 April 1917. At the conference 24 specific questions were discussed ranging from tactical issues, such as 'should Tanks operate in advance of the Infantry?', 'were tanks able to keep up with the infantry?', and 'what were the main difficulties Tanks experienced in crossing the German trenches?', to technical matters, such as 'whether any difficulty was experienced in using the Lewis guns?', 'whether the torpedo unditching gear worked successfully?', and 'whether Tanks ran short of petrol and water'?³⁰⁰

The responses to the questions and additional material were collated into a lengthy document 'published for the information and instruction of the Heavy Branch.' The document is unattributed but bears all the hallmarks of Fuller's

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TM: E2006.1730. 'Summary Of Tank Operations, I Tank Brigade, 9 April-3 May 1917',
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for example, TM: E2006.1727.10: 'C Battalion- Lessons learnt from Recent Operations', 19 April 1917; TM: E2006.1727.11 'C Battalion- Lessons learnt during the Battle of Arras, 23 April 1917'; TM: E2006.1727.8. 'I Tank Brigade -Notes on Tank Operations & Tactics', battle of Arras'
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TM: E2006.1730. 'Summary Of Tank Operations, I Tank Brigade 9 April-3 May 1917'

authorship. The author summarises his deductions and lessons under four headings: training, technical, tactical and administrative and command.

Under training, the author considered that the preparatory training had been sound and practical. There were however, a number of points which required attention:

- (a) More Tank driving over difficult ground must be carried out
- (b) Frequent driving with the differential locked must be practiced
- (c) All work and duties within the Tank must be reduced to a drill
- (d) Want of being able to apply "immediate action" to Lewis gun stoppages prevented many targets from being engaged.
- (e) More practice must take place in all types of signalling...
- (f) Crews must... understand that if they are given a definite objective, and are ordered to rally having accomplished their work on it, they must do so. It must be impressed on them that though it be most gallant to proceed further, it is inexpedient to do so...

On technical lessons, the paper highlighted the following 'serious considerations'

- (a) Bellying. A large percentage of failures by Tanks to reach their objectives was due to this trouble. If this difficulty were eliminated it is probable that more than 90% of starters would reach their objectives...
- (b) Stopping... it appears that a high percentage of the direct hits received occurred whilst Tanks stopped to change speed or turn. Whatever new means of control is adopted, it should be a one man one.
- (c) Ventilation. Better ventilation is required...
- (d) Armour. The present armour is known not to be proof against the latest pattern of German armour-piercing bullet...

On tactical lessons, the author made the general observation that, 'the frontage allotted and the number of tanks available did not permit of a tactically sound operation...'. He summarised the tactical lessons and referred each of them to the advice given in 'Training Note 16'.

- (a) Tank Echelons. That Tanks should be distributed in echelons in depth according to the main objectives, by this means continuity of action is maintained...
- (b) Reserves. That a strong reserve 25% to 50% of the total number of Tanks employed should be kept in reserve...
- (c) Sections to be kept intact... each section having one and only one objective.
- (d) Effect of Ground. That the present Tank should not be used on heavily shelled ground if this ground is wet, nor should it proceed without artillery support...

(e) Mass Tactics. That normally Tanks must be used in large numbers so as to obtain concentration of power, continuation of effort, mutual protection, certainty of action and reduction of artillery resistance...

(f) Moral effect of Tanks. That the moral effect... is very great, so great that now tanks have been employed, infantry in future will look to them for assistance.

(g) Tanks draw fire. That the appearance of a Tank at once draws fire... From this may be deduced...(i) Infantry must not bunch around Tanks...(ii) Tanks must be absolutely proof against all types of armour piercing bullets.

(h) Counter battery work. That Counter battery work is as essential to Tank operations as to Infantry... The closest co-operation must exist between the Gunners and Tanks

(i) Signal tanks. Experience points to the necessity for Signal Tanks...

On administration and control lessons, three 'outstanding' matters were identified:

(a) Establishments and labour. That the present establishments render it impossible for Tank units to provide the labour required during the preparatory stage or the operations themselves.

(b) That the introduction of Tank tenders as first line transport is absolutely necessary...

(c) Command. It is considered that for the present it is sound to keep Tank units as Corps troops... their allotment to objectives and their general role should be fixed by the Corps and that the reserves are held in the hands of the Corps... The duty of a higher Tank commander is to act as adviser to Armies and Corps in framing the plans, allotting objectives and routes to be followed.³⁰¹

If the author was indeed Fuller, it is not surprising that he should link the identified failings to the ignoring of his advice in 'Training Note 16'. Some problems, the insufficient numbers of adequately armoured and mechanically reliable tanks, were out of the hands of the higher commanders. These defects were in the process of being remedied for the next generation of tanks. Other problems, such as the large proportion of tanks that bellied in the mud or shelled ground, could have been avoided if higher commanders had heeded the previous advice of the tank commanders over the choice of ground.

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As the Official History stated: 'the tank was still important by reason of promise [rather] than performance'.³⁰² 'There was no cause... to doubt the future value of tanks ... with better handling, a better model ... and, above all, greater numbers, they would make a powerful contribution to victory.'³⁰³ The Heavy Branch had the opportunity to prove its value and promise two months later.

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Falls, C. *Military Operations ,France & Belgium, 1917* , Vol.1 (Macmillan, 1940), p.13, [hereafter, Falls, *OH 1917*, (1)]

³⁰³

Ibid.p.239

MESSINES 7-14 JUNE 1917

In General Plumer's attack at Messines Ridge, 2 Brigade of the Tank Corps was allocated to Second Army; A and B Battalions each had 36 fighting tanks of the latest Mark IV pattern. In addition, implementing a lesson learnt from Arras, each battalion had eight Mark I and II tanks converted into supply tanks.³⁰⁴

The attack was preceded by a five day artillery barrage and by the detonation of 19 large mines along the ridge. Once again the tanks showed their vulnerability when crossing ground badly cratered by artillery fire and mining. Of the 72 tanks that went into action, 48 tanks bellied although 16 were subsequently recovered and resumed action; 17 broke down mechanically and 11 were put out of action by shell or armour-piercing bullets.³⁰⁵

Both tank and infantry commanders could derive some doctrinal guidance from SS164 produced in May 1917, following lessons learnt at Arras and the arrival of the Mark IV tank.³⁰⁶ The tanks were generally employed 'as an adjunct to the Infantry attack' principally in attacking those strongpoints not already destroyed by the artillery. Except in a few isolated instances, the tanks did not contribute significantly to the success of the operation, the main problem being their difficulty in crossing cratered ground.

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TNA: WO158/858:Tank Corps Correspondence:Tanks at Messines: '2 Bde Report on Action'

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Ibid

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SS164. Notes on the use of Tanks and on the general principles of their employment as an adjunct to the Infantry attack. May 1917,(General Staff, 1917)

General lessons from the operation were published by GHQ in SS172 in July 1917.³⁰⁷ Lessons relating to tanks were brief: 'no new lessons were learnt' but emphasis was needed on a number of points; 'the tendency for Infantry to bunch behind tanks, [resulting] in an increase in casualties as Tanks invariably draw fire,' also 'a tendency ... to retain tanks to meet possible eventualities: it cannot be too strongly emphasised ...that when once the Infantry are firmly established on an objective, the Tanks should be withdrawn.'³⁰⁸

Colonel Courage, the commander of 2 Tank Brigade, produced a much more comprehensive post-operation report listing the deductions from the operation. On the technical side, he noted that the new armour plate (12mm hardened plate, distributed in the more vulnerable areas) was 'satisfactory and gave complete confidence to the crews', and he recommended that a better form of unditching gear should be carried by each tank. On the tactical side, Courage noted various operations which were in line with the advice given in SS164. 24 of the tanks, for instance, were held in Army reserve and used for the assault on the final objective line. He recommended that where fresh assaulting troops were used on the further objectives, they should be supported by fresh tank units, noting 'O.C. Tank Unit and his Staff are only human: they cannot go on fighting continuously'. This echoed the advice in SS164 and Fuller's recommendation for the use of successive echelons of fresh tanks. Courage emphasised the importance, and difficulty, of good reconnaissance work, particularly of the subsequent objectives.³⁰⁹

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SS172. Preliminary notes on the recent operations on the front of the Second Army, July 1917. (General Staff, 1917)

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Ibid. para.16

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TM: E2006.1814: '2 Tank Brigade Report on Operations. Battle of Messines. 22 June 1917' p.20

Courage reported that, both at Messines and Arras, the danger of tanks being hit by the enemy barrage at the starting point was not excessive, particularly if artillery counter-bombardment measures had been successful. He recommended that the starting point for the tanks should be about 800 yards behind the front line and that tanks should not attempt the crossing of no-man's-land before first light.³¹⁰

On liaison between tanks and supporting units, Courage considered that this had been satisfactory at all levels from Army down to Battalion commanders, with the distribution of operation orders between the various units. Courage echoed the point noted in *SS172* that, after the initial objectives had been achieved, tanks should not be used for minor actions but return to rallying points where their further use in reserve could be co-ordinated by higher command.³¹¹

Although in general, important lessons had been learnt at Messines, the overall impact of the tanks was limited. The overwhelming problems continued to be the mechanical failings of the machines and their vulnerability to poor ground conditions. Unfortunately this latter lesson had still not been fully appreciated by the higher command when the tanks went into action again just over a month later.

THIRD YPRES – 31 JULY TO 10 NOVEMBER 1917

The pause between the end of the Messines operation and the beginning of Third Ypres gave little time for the Tank Corps to improve upon the lessons learnt. Early reconnaissance of the area of operations by Tank Corps staff had caused Elles to have 'misgivings... After reconnaissances we reported that we could function if there

³¹⁰

Ibid.p.21

³¹¹

Ibid.p.23

was not intensive shelling. When the attack was postponed from the original date to the 31st July, I pointed out to the Fifth Army G.S. as strongly as I could that our chances fell with every shell fired.³¹² Churning of the ground by shell fire was compounded by the predicted appalling weather conditions which broke on the first day of battle and continued for days. However, the strategic importance of the Flanders area could not be compromised by the need to select better ground for the tanks.

Nonetheless, 216 fighting tanks were deployed at the opening of the offensive on 31 July 1917, all Mark IVs from the three brigades of the Tank Corps. Roughly one-third were allocated to clearing strongpoints, one-third to assist the infantry in the advance to the second objective and one-third in reserve. With one or two exceptions, notably the assistance in the capture of strongpoints near St Julien and the capture of the Cockcroft feature on 19 August, the tanks achieved very little. In the opening offensive, of the 136 tanks in the first wave, 77 tanks became ditched and 42 were lost to artillery fire, leaving around 19 tanks operational at the end of the day.³¹³

The heavy tank losses and casualties in the unfavourable conditions were such that Elles wrote to Haig on 7 September requesting the withdrawal of 5 battalions from the battle for training with a view to further operations on 'other fronts':

The state of the ground on the YPRES battle front is such that it will not be able to use Tanks until the line is advanced 1,000 to 1,500 yards.

When this is done there will be considerable difficulties unless the weather is exceptionally good, which will prevent the use of Tanks in large masses.

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Elles, quoted in Falls, *OH*, 1917, (1), p.379

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Liddell Hart, *Tanks*, (1), p.112

There is therefore no prospect of using Tanks until towards the end of the month.³¹⁴

Five days later, GHQ agreed to the withdrawal of all but four battalions from the Ypres sector.³¹⁵

Once again, Courage of 2 Tank Brigade collated the lessons learnt from his sub-unit commanders and sent a comprehensive report to GHQ. Courage reported that the 'new Unditching Gear was of the greatest assistance... The Mark IV Tank showed itself proof against the A.P. Bullet'.³¹⁶ On the tactical side, Courage emphasised the most important lesson:

(i) It is clear that the nature of the ground, over which Operations will take place, is still by far the most important factor from a Tank point of view. It may be possible to advance over certain swampy areas by use of the Unditching gear, but it is certainly not possible to fight over them'.

Courage identified a new threat, anti-tank guns:

(iii) This is the first occasion on which Anti-Tank Guns were a really serious matter... A lesson to be drawn would appear to be that on a front where there are only two or three narrow Avenues of Approach... Tanks should not be employed until the ground has been captured which overlooks them'.

He recommended that all crews should be trained in driving whilst under a gas attack. Courage noted that many crews of disabled tanks used their dismounted Lewis guns to assist the infantry and recommended that this should become standard practice. Finally, he concluded that if an attack was held up, it was not practical to send in further tanks unless they were accompanied by fresh troops.³¹⁷

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TNA: WO158/835: War Office Correspondence: Tank Corps: Tank Operations: Correspondence:Elles to Haig, 7 September 1918

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KCL Fuller papers, I/2/5

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TM:E2006.1817:'2 Tank Brigade Report on Operations, 31 July 1917 – Deductions', 21 August 1917.

³¹⁷

With the exception of a few minor actions, Third Ypres did little to enhance the confidence of higher command in the tanks. What was badly needed was an operation on ground more suited to the limited manoeuvrability of the existing machines. The Battle of Cambrai provided that opportunity.

CAMBRAI – 20 NOVEMBER TO 30 DECEMBER 1917

Credit for the inception of the Third Army attack on the Hindenburg Line at Cambrai by various parties has already been discussed. Elles was warned on 20 October 1917 in secrecy, of the likelihood of an operation and preliminary reconnaissance was started.³¹⁸ By 13 November 1917 final plans were issued for an operation to penetrate the German defences around Cambrai. It was to be a surprise attack, using all available tanks and with no preliminary artillery bombardment. The operation was to take place one week later on 20 November, leaving little time for preparation and planning by the units involved.³¹⁹

The Tank Corps was faced with the task of moving 476 tanks and crews into the area of operations under conditions of utmost secrecy, the majority being tanks recently deployed in the Ypres Salient, many needing repair. In addition, a comprehensive training programme was required of the tank battalions with their supporting infantry divisions.³²⁰ Fuller drafted a 'Training Note' issued by Third Army on 30 October to ensure 'Tanks and infantry are trained to the same system' and

TM: E2006 -1817: '2 Tank Brigade Report on Operations, 31 July 1917 – Deductions', 21 August 1917.

³¹⁸

³¹⁹ KCL Fuller I/3/26: GHQ to Fuller, 20 October 1917

³²⁰ See Hammond, *Cambrai*, Ch.4

KCL Fuller papers, I/2/15. 'Conference Tank HQ, 25/26 October 1917.'

issued a revised version to the Tank Brigades on 10 November, after collating the training reports from the Tank Brigades.³²¹ As no preliminary artillery bombardment was permitted by General Sir Julian Byng, the commander of Third Army, the primary role of the tanks was to crush the extensive wire entanglements to allow the infantry through. With the aid of diagrams, Fuller set out in detail how this was to be achieved. Special wire-crushing tanks were to be deployed with grapnel hooks to drag away the wire. An innovative solution was found to the problem of the widened German anti-tank ditches. A number of fighting tanks carried fascines (bundles of brushwood) to be dropped into the trenches enabling the tanks to cross.³²²

Fuller emphasised that training exercises should be simple, that the actions of the section of three tanks and the accompanying infantry unit should be practiced as a drill, that frequent practice in crossing the crushed wire should be carried out and that means of dealing with the unexpected should be carefully thought out by both the tank and infantry commanders beforehand.³²³ With one notable exception, training on the recommended lines went ahead within the six infantry divisions initially involved.³²⁴ An impressive initial breakthrough was achieved on the first day, with most tanks breaking through the wire with comparative ease. However, out of

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KCL Fuller papers I/2/39a. 'Notes on Tank and Infantry Training', 10 November 1917.

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Liddell Hart, *Tanks*, (1) p.133

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TM: E2014.803. 'Training Note. Tank and infantry operations without methodical artillery preparation' 10 November 1917. also reproduced in Falls, *OH 1917 (1)*. apps. 9a & 9b

³²⁴

Major-General Harper, GOC 51st (Highland) Division, was subsequently criticised for not fully embracing the use of tanks and the recommended infantry tactics for the delay in taking Flesquières, although much of the criticism has been comprehensively challenged more recently. See Hussey, John, "Uncle' Harper at Cambrai: A Reconsideration', *British Army Review*, 117 (1997), pp.77-91

the 350 fighting tanks deployed, 176 were out of action by the end of the day through mechanical problems, ditching and anti-tank fire. Thereafter the momentum of the attack petered out and the operation was finally brought to a halt after the successful German counter-attack on 30 November, with little achieved in terms of ground gained.³²⁵

After-action reports were received from the three Tank Brigades. Colonel Baker–Carr, commanding I Tank Brigade, commented on training and co-operation with his two infantry divisions prior to the attack:

The principle of co-operation between Tanks and Infantry as adopted in this battle was so satisfactory that it rather suggests the desirability of always training the same Tank formations with the same Infantry formations thus making a composite force...

I consider the greatest factor of success in the operations under review was the preliminary work done at WAILLY between the Infantry and the Tanks.

He included a section on recommendations for future training. 'A great deal of attention' should be devoted to further training on the 6-pdr and Lewis guns; 'a good deal of practice' should be given to approach marches under service conditions; the standard of driving was generally good but 'is capable of further improvement'; 'the driving course at WAILLY proved most valuable and every officer and driver should undergo the course during the training period'; 'the mechanical knowledge of the crews has very much increased and... should be able to deal with most forms of mechanical trouble.' He recommended the distribution of notes on infantry and tank training to divisions and suggested the attachment of infantry and cavalry officers to tank units for a fortnight and for tank officers to lecture at Army and Corps Schools.³²⁶

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Hammond, *Cambrai 1917*, Ch.11

³²⁶

TM: E2006.1757-3. 'Summary of Operations, 20-23 November 1917. Ist Bde Tank Corps.'

The report from 2 Tank Brigade emphasised that the eight day period allowed for training with the infantry was far too short and that at least a month was needed for future operations. There were problems in the later stages of the battle with infantry reinforcements that had not undertaken any co-operative training with the tanks. Courage also recommended that tank officers should assist in the training of divisions over the coming winter to improve co-operation. He believed that the Tank Section Commander should be co-located with the infantry unit he was supporting rather than travel in a tank. He recommended that tank NCOs could be trained to command a tank in place of an officer.

Colonel Courage stated that visibility from the tank should be improved, particularly if fascines were being carried; that more fuel should be carried to increase the operational range; and that the Lewis gun mountings should be armoured. The use of smoke was an important factor in tank operations and he made various suggestions for tanks to produce their own smoke cover rather than rely on the artillery. His recommendation on tactics was that the accompanying infantry should adopt skirmishing drills when advancing with the tanks. To lighten their personal load, he suggested that some infantry and engineer equipment could be carried in special infantry carrier tanks.³²⁷

Colonel Hardress Lloyd's report for 3 Tank Brigade reinforced many of the points made by the other two commanders. It appears that his tanks experienced more mechanical problems, particularly with the track pinion wheels. On training, he came up with a radical suggestion: 'A Brigade of Infantry to be attached to each Brigade of Tanks during the training period in the winter. As soon as Operations in the Spring are decided on, the trained Tank Infantry will be split up amongst the

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KCL Fuller papers, I/3/29. '2nd Brigade, Tank Corps, Report on Tank Operations. November 20 to December 1, 14 December 1917.

Infantry Divisions with which the Tanks are going to work.' This foreshadowed the concept of Mechanised Infantry used successfully in future conflicts.³²⁸

Third Army produced its own comprehensive report on lessons learnt. The report emphasised that the training of infantry to advance behind tanks was as important as training to advance behind a barrage. In particular the infantry needed to practice assembling and advancing behind tanks, crossing through the gaps in the wire, trench clearing and that these techniques needed to be practiced in the dark. Various tactical lessons were learnt: the need for a large reserve of tanks to replace casualties; tanks were vulnerable to field guns at short range; tanks could not deal with enemy in built-up locations; tanks should not get ahead of the infantry but remain until trench clearing operations have been successful; tanks needed to make more tactical use of the ground; lateral movement of tanks across the battlefield should be reduced to the minimum to avoid damage to communications and tracks. An important and realistic lesson for the future was that the infantry 'must not expect too much from the Tanks.'³²⁹ They must be prepared to provide their own protection using platoon weapons and to assist the tanks in countering anti-tank guns. Foreshadowing the role that tanks had to adopt in the following year, the report pointed out that tanks were useful in defence: for counter-attack, as mobile machine gun posts and for forming a defensive line.³³⁰

Major-General Capper, the Director General of the Tank Corps [DGTC] summarised the lessons learnt. He believed that, if surprise could be achieved,

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KCL Fuller papers, I/36/30. 'Report on 3rd Brigade Tank Corps Operations with Third Army, Nov 20 -27, 1917'.

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KCL Fuller papers, I/3/31. 'Lessons learnt from recent Operations by the Third Army', February 1918.

³³⁰

Ibid

small numbers of troops, even if tired, could achieve great results. However, the troops were worn out after advancing between five and six miles and they should be followed by successive waves of fresh troops. He confirmed that Infantry Supply tanks were essential to prevent the infantry becoming exhausted and that the supply system for the tanks needed careful study. The front on which the tanks operated was too narrow to give decisive results and the numbers involved were too few. 'Numerous tanks for exploiting success at once are necessary.'³³¹

Capper made a surprising comment about cavalry, the arm that many tank advocates saw as being made redundant. 'I do not [Capper's emphasis] think that the battle confirms the view of those that hold that Cavalry are out of date. They should be invaluable to obtain speedy and decisive results.'³³² Capper considered that initial success was useless unless heavy reserves were available and everything depended on the depth of penetration over a wide front in the first 24 hours.

On the use of tanks in villages, as at Flesquières, La Fontaine and Boursies, Capper recommended that the tactics needed 'systematizing'. The village should be treated as a trench attack, with parties detailed for specific tasks with 'moppers-up' on hand with Engineers to deal with strong-points. Surprisingly, he recommended that tanks should remain until the village is secured, ignoring the fact that the tanks used at Cambrai proved to be very vulnerable when used in attacks on villages. Capper ended by emphasising that 'the Tank Corps requires much Tactical Training

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WO 32/5933. 'Lessons from the Cambrai battle. 19 December 1917.'

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For general discussion on the use of cavalry in the Great War, see: Badsey, Stephen, *Doctrine and Reform in the British Cavalry 1880-1918* (Aldershot: Ashgate, 2008); Kenyon, David, *Horsemen in No Man's Land; British Cavalry and Trench Warfare 1914-1918* (Barnsley: Pen and Sword, 2011); Sheffield, *The Chief*, p.250

in itself and in conjunction with other arms, and other arms in combination with Tanks.'³³³

In summary, the use of tanks at Cambrai provided useful lessons for the following year. In assessing the extent to which the tactics used complied with the doctrine so far produced by the Tank Corps the following points emerge. The tanks, because of mechanical and physical limitations, could only operate effectively over firm ground that was not already cratered by an extensive artillery barrage. At Cambrai, the natural topographical conditions of the ground were practically ideal for tanks. Moreover, the short, surprise artillery barrage had not cratered the ground to anything like the same extent as at the Somme or Ypres and presented no real obstacle. Co-operation with the supporting infantry and training with them prior to operations was carried out as well as it could in the short time available and was invaluable. The weakness was that in most cases reinforcing infantry units had no similar training. Also, the somewhat random re-allocation of surviving tank units to infantry units after the initial breakthrough meant that many tanks were left operating with units with which they had not been trained. Contrary to the advice given in *SS164*, the tanks proved to be very effective in creating passages through the wire.

What doctrinal principles were neglected? The most serious and obvious omission was the lack of tank reserves to exploit the initial breakthrough. Almost all the initial wave of 350 tanks was tasked with breaking through the wire. There were then insufficient fresh echelons of tanks to exploit the initial successes. The follow-through actions to take the canal crossings and Bournon Wood were delayed and ineffective because the by- now exhausted tank crews had to rally to refuel and rearm before redeploying.

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WO 32/5933. ' Lessons from the Cambrai battle. 19 December 1917.'

The Official History concluded: 'The sudden and swift penetration of the Hindenburg position, which embodied the latest defence theories of some of the best brains in the German Army, would not have been possible without the tank.'³³⁴

The doctrinal and tactical instructions hastily produced by Fuller and GHQ during German offensive in March 1918 have already been described in the preceding chapter. Meanwhile, by mid-May 1918, the Mark V tank was arriving in France. This was a significant improvement in tank design and reliability. The new Wilson epicyclic gearbox requiring a single steersman instead of four, the new 150 horsepower Ricardo engine and other design improvements meant that machine was more powerful and manoeuvrable and did not need to stop to change gear or direction, reducing its vulnerability. Sixty of these machines were available for a small but significant operation at Hamel in early July 1918.³³⁵

HAMEL 4 JULY 1918

The village of Hamel had been taken by the Germans in April 1918. It formed a salient in the Allied front line, overlooked Amiens and threatened the operations planned for the summer. Rawlinson allocated the task of capturing it to 4th Australian Division. Lieutenant-General Monash, commanding the Australian Corps, had the support of 5 Tank Brigade, now commanded by Courage, recently promoted to Brigadier-General.

Monash was an Australian Militia officer who was an engineer in civilian life. He applied his commercial and production experience to the meticulous planning of

³³⁴

Falls, *OH, 1917,(1)*,p. 291

³³⁵

Prior and Wilson, *Command on the Western Front*, p.295

this relatively small operation. At the outset, Monash proposed to Rawlinson that: 'The operation will be primarily a Tank operation – at least one, preferably two, Tank Battalions will be employed.'³³⁶ In particular, he fostered the closest co-operation between his infantry units and their supporting tanks with specific tank units permanently 'embedded' with Australian infantry units. This was all the remarkable, and necessary, as the Australian unit chosen for the operation was the same that had suffered badly from the poor performance of the tanks at Bullecourt in the Arras offensive the year before.³³⁷

Of the 60 tanks employed, only three failed to reach their objectives and five were disabled but returned to the fight later. Monash had agreed with Courage two significant changes in tactics:

Firstly, each Tank was, for tactical purposes, to be treated as an Infantry weapon; from the moment it entered battle until the objective had been gained it was to be under the exclusive orders of the Infantry Commander to whom it had been assigned.

Secondly, the deployed line of Tanks was to advance, *level with the infantry*, [Monash's italics], and pressing close up to the barrage... Tank experts, consulted beforehand, considered that it was not practical for tanks to follow close behind an artillery barrage. The battle of Hamel proved that it was.³³⁸

The latter point, settled, at least for this operation, the on-going debate about where tanks should deploy in relation to the infantry; in advance of, behind, kept back for subsequent exploitation or, in this case, forming an integral component of an all-arms, tank-infantry combat unit. The answer appeared to lie with the particular circumstances of the action and plans of the battle commander, the experience and

³³⁶

Monash, Lieutenant-General John, *The Australian Victories in France in 1918* (Hutchinson & Co., 1920) p.46

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For recent research on Hamel, see Pederson, P, *Hamel* (Barnsley: Leo Cooper, 2003) and Prior and Wilson, *Command on the Western Front*, pp. 295-300

³³⁸

Monash, *Australian Victories*, p.50

training of the troops involved and the specific threat from enemy artillery. The fact that no tank casualties resulted from barrage fire at Hamel indicates that it was the correct doctrine in this instance.

An innovation, resulting from Cambrai lessons, was the use of specially designed supply tanks to bring forward supplies for the infantry and tanks onto the objective shortly after it had been taken. The outcome of the operation was successful, all objectives being gained, (in 93 minutes compared to Monash's estimate of 90 minutes), with little loss to the Australians. After the battle, GHQ published a document which summarised the lessons learnt, including the comment: 'The success of the attack was due... [to] the skill and dash with which the tanks were handled and the care taken over details in bringing them up to the starting line.'³³⁹ Also, the GHQ publication, *Notes on Recent Fighting No. 19*, commented that 'the Tanks proved of great value in protecting the flanks of the attack' – a role for tanks identified earlier by Fuller in 'Training Note 16'. GHQ also stated: 'the value of Tanks in assisting infantry to advance was conclusively proved' whilst cautioning that at Hamel there was little wire, that the ground was suitable for tanks and that the objective was both limited and within the range of supporting artillery.³⁴⁰

HQ Tank Corps held a conference on 10 July 1918 when the main tactical lessons were identified as:

- (i) Objectives should be tactical points
- (ii) Separate Tank Echelons should operate against each main objective line
- (iii) Reserves of Tanks should be kept in hand

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³⁴⁰ SS218. *Operations of the Australian Corps against Hamel, etc, July 1918* (General Staff, July 1918)

Notes on Recent Fighting, No.19. Attack carried out by the Australian Corps near Hamel on 4 July 1918. General Staff 40/WO/6392. (HMSO, October 1918)

(iv) Tanks should always be used offensively on the flanks if the ground permits of this³⁴¹

HQ Tanks produced its own lessons from the action in the form of 'Battle Notes': 'the necessity of previous training and closest co-operation with the infantry'; 'the necessity of practicing approach marches by compass by night'; 'practice of moves from an assembly position in the dark so as to be at a place of deployment at a given hour'; 'concealment of Tanks and personnel at assembly positions'; 'taping of routes in a place where growing crops are prevalent'; 'importance of practicing communication between infantry and tank crews'; 'training of supply personnel'; 'practicing of drivers to manoeuvre their Tanks so as to crush machine guns, drive up and down banks, through orchards, woods, etc'; 'better co-operation between drivers and [tank] gunners...to steady the Tank when good targets are observed'; 'practicing towing other disabled tanks'; and finally, 'the necessity for training Tank Commanders that they are in command of their tanks... and must be in a position to carry out this role... only in the most exceptional cases should they man one of the guns.'³⁴²

Hamel was a relatively minor action in the general scale of operations on the Western Front but it provided the opportunity to test and prove the new Mark V tank and the use of supply tanks. It heralded the innovative use of aircraft in a supporting role. It reinforced the critical importance of previous training and co-operation with the supporting infantry. It demonstrated that rigid adherence to tactical doctrine with regard to the positioning of the infantry with tanks was not necessary and depended

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TNA: WO158/840: War Office Correspondence: Tank Corps: Meetings & Conferences: 'Minutes of Conference held at Headquarters Tank Corps, July 10th, 1918.'

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TM: E2006.478: HQ Tank Corps. *Battle Notes* 2. 13 July 1918.

on circumstances. Finally, it pointed the way to the all-arms combat units used with such success later in the year.

By late July it was clear to Foch that the Germans had exhausted their available reserves and were losing the momentum on the Western Front. The Hamel raid had demonstrated the success of the new Mark V tank combined with support tanks. Following the successful Allied counter-offensive which ended the Second Battle of the Marne in early August, Foch judged that the time was right for the Allies to turn to the offensive.

AMIENS, 8 – 12 AUGUST 1918, AND THE HUNDRED DAYS

Haig had been considering an August offensive around Amiens using Rawlinson's Fourth Army including the Australian Corps and the Canadian Corps which was to be transferred into Fourth Army for the offensive. All available tanks in France were to be employed in support: nine heavy tank battalions with 324 battle tanks, a combination of Mark Vs and the elongated Mark V*; two light tank battalions with 72 Medium A Whippets allocated to the Cavalry Corps; 120 supply tanks (50% as infantry supply carriers) and 22 gun carrier tanks, a total of 610 tanks in all, the greatest concentration of armoured vehicle so far assembled.³⁴³ In addition, a battalion of armoured cars was attached to the Australian Corps. An innovative use of 30 of the larger Mark V * to each carry two infantry machine gun teams directly onto the third objective was only partially successful because a number were

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Edmonds, Brigadier-General Sir James, *Military Operations in France and Belgium*, Vol. 4. [hereafter Edmonds, *OH*, 1918, (4)] p.24. However, Liddell Hart puts the numbers of Whippets at 96. Liddell Hart, *Tanks*, p.177

destroyed. Moreover, the machine gun teams that did arrive were so overcome by heat, fumes and sickness that most were unable to perform effectively.

Although the tanks contributed substantially to the initial advances on the first day, the attrition rate over the following days was significant. Only 145 remained fit for action on the second day, only 67 on the third day and further losses subsequently. Most losses were attributed to effective enemy anti-tank measures and to the on-going problem, mechanical breakdowns, in addition to crew sickness and exhaustion.³⁴⁴

Tank related lessons from Amiens were collated by Fuller's successor at Tank HQ, Lieutenant-Colonel H. Karslake. His comments were somewhat more succinct than those of his predecessor. He noted that most tank casualties were caused by direct artillery fire and that the supporting infantry should be on the lookout for such guns. He commented that the infantry should push on to their objectives even if a tank was knocked out. Karslake stressed that mutual assistance and co-operation with the infantry during operations was essential for success. On tactics, he pointed out the danger of tanks pushing on around woods and copses without being sure that they had been 'mopped-up'. For attacks in daylight, smoke cover was essential. Many lessons had previously been identified and were reiterated. A reserve of tanks was essential to maintain the momentum and to deal with unforeseen contingencies. Tanks should operate in their units, not as individuals. When operating over old battle areas, former defences might not be obvious and Whippets in particular were unable to cross old trench systems. He

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Liddell Hart, *Tanks*, (1), p.184. Opinions on numbers vary, TNA: WO153/24 gives: on 8 August, 421 tanks into action; on 9 August, 143 tanks fit for action; on 10 August, 79 tanks fit for action and on 11 August only 38 tanks remain in action.

emphasised that 'the enemy of the Tank is the gun' and that the tanks needed to move rapidly and with no halts. Finally, Karslake concluded:

The ideal is to break through as far as possible with the heavy Tanks and to follow them up with the Whippets and armoured cars, so as to keep the enemy on the move and cause the utmost confusion on his line of communications.³⁴⁵

Fuller's own deductions from Amiens were later recorded as:

- (i) That once preparations are well in progress it is almost impossible to modify them to meet any change in objective
- (ii) That the staying power of an attack lies in the general reserve. In this attack the tank general reserve was very weak, consequently after August 8 tank attacks 'petered out.'
- (iii) That the Tank is an assault weapon. Its role is in trench warfare. Once open warfare is entered on infantry must protect tanks from artillery fire.
- (iv) That the endurance of heavy tanks may, at present, be put down as three days, after which they require overhaul.
- (v) That the supply tank is slow and heavy; a light machine such as a cross-country tractor should replace it.
- (vi) That at present wireless and aeroplane communications cannot be relied upon...
- (vii) That the attachment of tanks to cavalry is not a success; for, in this battle, each of these arms in many ways impeded rather than helped each other. During the approach marches the Whippets were frequently reported to have been unable to keep up with the rapid movement of the cavalry; during actual fighting the reverse took place.³⁴⁶

On the specific role of the tanks at Amiens, opinions were divided. Edmonds considered that 'the action of the tanks and cavalry, though they won small triumphs, did not come up to expectations.'³⁴⁷ He believed that the tanks could have achieved more if they had been held back and used later on the first day when the early morning mist had cleared. He also believed that they were misused in clearing woods and villages and crushing MG posts. He provoked later controversy by

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TM: E2007.2250. *Weekly Tank Notes No.2. Lessons learnt from the experience gained during the operations August 8th to 12th on the Somme.* 17 August 1918.

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³⁴⁷ Fuller, *Tanks in the Great War*, p.228

Edmonds, *OH*, 1918, (4), pp.156-157

claiming that the Germans attributed, quite falsely, their defeat at Amiens and in the subsequent actions of the Hundred Days to the massed appearance of tanks at Amiens. Edmonds pointed out that:

no massed tank attack was made, not even planned, and that no attempt at a raid behind the enemy lines was made except by the 17th Armoured Car Squadron. Even the moral effect was not so great as claimed... but a legend which persists to this day was created. Actually the infantry with machine guns was the instrument of success but its vital assistance was the artillery.³⁴⁸

Liddell Hart reacted vigorously to Edmonds' 'extraordinary assertion' that the tanks had not played a significant role in the collapse of the German Army after Amiens.³⁴⁹ Although Liddell Hart's view was inevitably biased, there is little doubt that Amiens was a pivotal battle from the tank point-of-view. Harris, whilst conceding that, 'there can be little doubt that the exceptionally large numbers actually used contributed to the magnitude of the success and to the modesty of its cost' believes that a significant victory could have been achieved using fewer tanks. This is a view with the benefit of hindsight. Clearly, it would have been reckless for Rawlinson not to have used all the tank resources available to him at the time for this critical operation.³⁵⁰

Hereafter until the Armistice, Allied operations were largely characterised by semi-mobile warfare, the conditions that the tank advocates thought would be ideal for tank operations.³⁵¹ However, the reality was not so promising. In the many

³⁴⁸

³⁴⁹ Ibid, pp.156-157

³⁵⁰ Liddell Hart, *Tanks*, (1), p.185

³⁵¹ Harris, *Men, ideas and tanks*, p.180

For general discussion on tactics and operations during 'The Hundred Days', see Boff, Jonathan *Winning and Losing on the Western Front: The British Third Army and Defeat of the Germans* (Cambridge: Cambridge University Press, 2012) and Lloyd, Nick *Hundred*

smaller actions which followed culminating in the breakthrough the Hindenburg Line in late September, tanks were employed with varying degrees of success. They were once again used in 'penny-packets', not as a matter of operational doctrine, but reflecting the reality of insufficient numbers of available tanks caused by production priorities at home, mechanical problems, lack of spares, increased casualties from more effective German anti-tank measures and, to some extent, the allocation of tanks to the Americans operating to the south. Hammond cites other factors: the lack of training opportunities for replacement crews because of the fast-moving tempo of operations and lack of time between the inception and execution of operations; the demand for the use of the limited numbers of tanks in smaller operations grew enormously, as commanders' confidence in their utility increased and Foch's policy of a series of sequential, dispersed operations put a considerable strain on the logistics of moving tanks and crews to where they were needed next on the battlefield.³⁵²

For these later actions, doctrinal guidance was provided by SS214. This was issued to formations in August 1918, too late to be of assistance in the planning for Amiens but available for the subsequent operations. The instruction dealt with 'Special Considerations in Open Warfare', the operational situation that existed after Amiens. The guidance emphasised the difficulty in open warfare of obtaining information about enemy locations, particularly artillery batteries, and the need for rapid action. The use of aerial reconnaissance and co-operation with the artillery to destroy enemy batteries was recommended. Tanks would be particularly vulnerable to artillery fire during an advance after a breakthrough had been achieved. So it was

Days; The End of the Great War (Viking, 2013)
³⁵²

Hammond, 'After Amiens', pp.56 -59

recommended that tanks should not form part of an infantry advanced party but held back to tackle any strong centre of resistance:

When such centres of resistance are encountered, the closest co-operation will be necessary between the commander of the formation concerned and the tank commander in order that an attack may be quickly organised. It is essential, however, that any such operation should take the form of an organised attack, that the co-operation of the several arms should be ensured, and that the tanks should be used as a concentrated force of such size as may be necessary. Some artillery support will generally be required.³⁵³

Generally, such doctrinal guidance was followed. The weakness was the increasing difficulty in ensuring the 'concentrated force of such size as may be necessary'³⁵⁴ for the reasons set out before.

Little further doctrinal guidance emanated from HQ Tanks during this period. This may be due to a number of reasons: first, commanders at all levels were becoming more familiar and experienced in operating with tanks and did not require directions from above. Generally, there was more confidence by higher command in the ability of lower commanders to take decisions on the battlefield and this attitude percolated down to the tank and infantry commanders. Second, Fuller had left HQ Tanks at the beginning of August and was involved in setting up the new tank branch, SD7, at the War Office. However, this did not stop him collating tank action reports from the various smaller engagements during this period and issuing lessons learnt through the medium of the *Weekly Tank Notes* circulated widely by SD7.³⁵⁵

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SS 214 *Tanks and their Employment in Co-operation with other Arms* (August 1918)
Ch. IV, Sec.9, p.13

354

Ibid.

355

Foot, *Three Lives*, p.204

Major Foot, Fuller's assistant at SD7, recounted the genesis of this publication:

This publication had an interesting history. It was started by Fuller with the idea of circulating among some of the senior officers at War Office, to give them the latest information about tanks, Either Fuller or I went over to France for all the important tank actions, so that we were able to give in Weekly Tank Notes an account of recent happenings; to this we added various items about new types of Tanks, carefully selected statements from German prisoners, notes about French and American Tank developments, and similar information. Occasionally we would include articles, written either by Fuller or myself, of a more definitely propagandist nature.³⁵⁶

Although the *Weekly Tank Notes* were distributed to all branches of the War Office, Cabinet Office and to Haig's GHQ, it is not clear whether the content filtered down to the operational level.

What was becoming clear from the various reports received was that the constant mobile and frequent, smaller set-piece operations in this last phase of the war were having a serious effect on the resources of the Tank Corps, both men and materials. In September 1918, for instance, it was reported that:

The great heat, the long distances travelled, and the amount of fighting has been a very severe trial for the Tank crews, while the strain on Commanders and Staffs has been enormous, with the constant necessity of making hasty arrangements with infantry formations... The Tank Corps is now deficient of about 250 Officers and 2,000 other ranks (representing about 30 per cent of the fighting strength)...

During the recent fighting it has been quite impossible for the small Tank Corps in France to supply Tanks in every place they were required and demanded.³⁵⁷

The number of tanks available for the remaining actions diminished rapidly, despite the setting up of Tank Salvage Companies which recovered a total of 8,819 disabled tanks from the battlefield for repair and re-issue.³⁵⁸ On 8 October, for the attack

³⁵⁶

Ibid, p.204

³⁵⁷

TM: E 007.250. Weekly Tank Note 3.

³⁵⁸

south of Cambrai, only 100 tanks could be assembled. For the attack on the River Selle on 17 October, only 48 tanks were available. For the last tank action of the war, in the Forest of Mormal on 4 November, the remaining resources of the Tank Corps were down to 37 tanks and a handful of Whippets.³⁵⁹

German morale and discipline had been badly affected by the Allied successes. Despite a number of spirited counter-attacks in the following weeks, an Armistice came into force on 11 November. The concluding chapter will review the progress in the design and use of the tank, in the period of just over two years, from its baptism of fire in September 1916 to the Armistice, the development of tactical and operational doctrine in the light of combat experience and the training of the commanders and crews.

Liddell Hart, *Tanks*, (1), p.193 . This figure must inevitably include numbers of tanks recovered and re-issued many times.

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Liddell Hart, *Tanks*, (1) pp. 193-194

CONCLUSION

A number of research questions were posed in the introduction to this thesis. How did tactical requirements first evolve in the absence of combat experience? How did early training address the perceived tactical requirements? How did those requirements evolve in the light of actual battle experience? How was training implemented? What was the training organisation? What were the restraints on training, and was it effective? How did tank operational doctrine evolve? Who derived it and how? How was it implemented? How did it fit in with overall BEF operational doctrine? Finally, to what extent did operational and tactical tank doctrine and training contribute to the outcome of the Hundred Days?

Early tactical doctrine was largely formulated by Swinton. Despite having no combat experience to guide him, Swinton produced a series of memoranda on the tactical employment of tanks. Haig was anxious to use whatever tanks were available for his planned offensive in September 1916. GHQ modified and endorsed Swinton's proposals and produced its own somewhat cautious doctrine, just before tanks were committed to battle for the first time. Swinton, meanwhile, in the very short period of time available to him, had to raise and train the tank companies required to man the tanks. He was hampered by insufficient number of tanks and weapons to train on and a lack of experienced instructors. He also had to cope with a change of training location from Bisley to Elveden. Early training concentrated on technical matters; driving and maintaining the machines and firing the weapons. There was little, if any, training on the tactical handling of the machines or of cooperative training with infantry. Despite the best efforts of Swinton, there seems little doubt that the first tank crews were not adequately trained when they went into

action on 15 September 1916. Understandably, at that stage, higher commanders also had little experience of the capabilities, and limitations, of the tank.

After-action reports were collated after each tank action and the results analysed by the various formations involved. The system was formalised within the Tank Corps with the production of individual Tank History Sheets and comprehensive reports from Tank Battalions and Brigades. While most were concerned with technical matters, tactical and operational issues emerged and influenced the advice given to GHQ by HQ tanks, usually by way of the various papers written by Fuller.

Following the Somme and the growth of the Tank Corps, training was expanded and better organised. Under the enthusiastic direction of Gore Anley, the main tank training centre was established in the UK at Bovington, concentrating on individual skills. Much use was made of battle-experienced instructors to train the new recruits before they were sent to France. In France collective training concentrated on forming and training tank companies and battalions and introducing some basic tactical training resulting from lessons learnt on the Somme. Tank companies with battle experience formed the cadres around which the new battalions were created. Throughout the war, however, this split between training in both the UK and France caused some degree of duplication and friction and it is debateable whether all training should have been carried out in one or other of the locations. A particular problem at Bovington in the early days was insufficient tanks on which to train, whereas in France a tank unit could train on its own machines. A recurrent theme was the lack of opportunities for co-operative training with supporting infantry units.

Doctrinal guidance received considerable impetus with the arrival of Fuller at Tank HQ in late December 1916. His numerous and voluminous papers on tank

doctrine, although in many cases far too visionary to be practical, undoubtedly had an influence, in due course, on GHQ's views on the use of tanks. In the absence of guidance from GHQ, initial guidance was largely formulated by Fuller, in particular his 'Training Note 16'. In time, with the establishment of Solly-Flood's Training Directorate at GHQ, more formal doctrine was produced. The publications, *SS135*, *SS164*, *SS204* and *SS214*, all laid down, in varying degrees, GHQ's doctrinal guidance on the use of tanks for the benefit, not only of the Tank Corps but, more importantly, for the other Arms and Services. The influence of the WO and War Cabinet on tank doctrine was slight until the appointment of Wilson as CIGS with Lawrence as his deputy. In the light of greater co-operation with the French and the Americans over the use and development of tanks, the War Office produced some firm guidance for future tank operations, clearly based on Fuller's 'Plan 1919'. With the somewhat unexpected cessation of hostilities in November 1918, this future doctrine was never put to the test.

The various tank actions after the Somme produced lessons to be incorporated into future doctrine and training. At Arras, the promised Mark IV tanks did not materialise in time. Adverse ground conditions and the mechanical weakness of the older tanks led to disappointing results. At Messines the improved Mark IV with unditching gear showed promise but the tanks suffered again from unsuitable ground conditions. Third Ypres was a disaster for the tanks. The appalling ground conditions led to the early withdrawal of the tanks and for a time the future of the Tank Corps seemed uncertain. Cambrai offered the ray of hope. There the tanks operated over more suitable ground and achieved considerable success on the first day. However, there was a lack of tank reserves to exploit success. Throughout 1917, the recurrent themes were of insufficient numbers of

tanks, their mechanical weakness and their vulnerability to ground conditions and enemy counter-measures, resulting in a lack of reserves to exploit opportunities.

Following the defensive role thrust on the tanks during the March offensive in 1918, for which they were not well suited, the actions at Hamel and later at Amiens, using the much improved Mark Vs, Whippets, armoured cars and supply tanks, marked the move to open, offensive warfare, the role for which the tanks were more suited. However, the almost continuous actions after September over a wide front placed enormous strain on Tank Corps resources. Because of the logistical problems of moving sufficient numbers of tanks to where they were required by commanders who were now more confident using tanks, tank actions inevitably reverted to the 'penny-packets' Fuller and others had warned against. The rapid pace of operations between August and November led to a dramatic drop in the numbers of available tanks due as much as to mechanical problems, lack of replacements and spares, and trained crews as to determined enemy counter-measures.

In just over two years from the first use of tanks to their final actions before the Armistice, British tanks had seen dramatic mechanical and technical improvements. Nevertheless, the available armoured vehicles remained mechanically unreliable, slow and vulnerable to enemy counter measures. Furthermore, production had to compete with other priorities and there were never enough tanks to meet demand. Doctrine for the use of the tanks developed in the light of combat experience and hand-in-hand with technical improvements. Growing confidence in their capabilities, and acceptance of their limitations, among senior commanders earned tanks a respected place in the all-arms actions towards the end of the war.

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